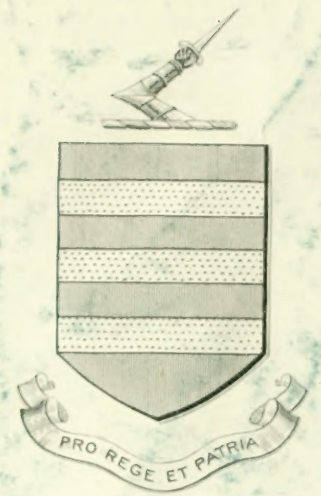


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T. H. CAMERON,
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THE

AMERICAN YEAR-BOOK

OF

MEDICINE AND SURGERY

BEING

A Yearly Digest of Scientific Progress and Authoritative Opinion in all Branches of Medicine and Surgery, drawn from Journals, Monographs, and Text-Books, of the Leading American and Foreign Authors and Investigators.

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

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PROFUSELY ILLUSTRATED.

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PREFACE.

THE cordial reception given the *Year-Book* of 1896 has stimulated the editors to renewed enthusiasm in the preparation of the present volume, and encourages us to believe that the plan and execution of the work meet a clear professional want.

A few changes will be noted in the names of those in charge of some of the departments. The pressure of professional work forced Dr. Hardaway to resign the editorship of the department of Dermatology, and it was with great reluctance that I was compelled to admit that his excuse was ample and just. Readers will be glad that Dr. Duhring, whose rank as a scientist in his specialty needs no word of emphasis, has consented to assume the editorship. The other editorial changes were made for reasons similar to those of Dr. Hardaway. In the main, however, the editorial staff remains the same as that of the issue of 1896.

A noteworthy and, I believe, a useful feature of the present volume consists in the brief recapitulations of the trend and results of the year's work preceding each article.

The activity of scientific investigation and progress and the tremendous quantity of the literature to be reviewed, sifted, and judicially pronounced upon have necessitated a most rigorous choosing and condensation—a labor which only unselfish and enthusiastic workers can accomplish. The generous loyalty of the departmental editors cannot be too highly appreciated by those who make use of their work. It has been and will remain our purpose to effect this epitomization within a single volume by means of greater attention to the practical and clinical aspects of medicine. While not neglecting the more peculiar and theoretic researches, we think that the needs of the active and practising physician are the first and more important to be supplied.

It will be noticed that the plan of pronouncing editorial judgment upon new proposals and investigations has become a more distinctive characteristic of the present volume, and there is a general agreement that it is precisely this feature that will make the book still more acceptable to those whom the demands of practice leave little time to settle matters of controversy

and doubt, and who must therefore welcome the ripe decisions of those most capable of pronouncing them.

With one unfortunate exception all publishers deserve, and we believe will receive, the gratitude of the profession for the willingness and prompt courtesy with which they helped us with our work. No one journal and no combination of journals can hope to reach the entire profession or to give a complete and digested account of all medical progress. Any proper method, therefore, which aids in bringing the results of medical science to a still larger number of the members of the profession must be looked upon by every earnest physician as worthy of encouragement, helpful of progress, and of benefit to humanity. Any attempt to limit such extension of knowledge is inimical to the profession and to professional progress.

GEORGE M. GOULD.

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GENERAL MEDICINE.

By WILLIAM PEPPER, M. D., and ALFRED STENGEL, M. D.,

of Philadelphia.

General Review of the Year's Work.—In the limits of a few introductory sentences we can only note some of the more striking facts and comment upon the tendencies of the investigations of the year under review.

Nothing is more refreshing in the study of a year's medical work than the evidence exhibited in the literature of our own countrymen, as well as in that of foreign nations, that experiment and investigation are taking the place of speculation. The present is undoubtedly an age of experimentation, and those who pursue this method of study reach the most useful results. Already the fruits of laboratory-work are manifest in the greater accuracy of the knowledge of certain affections and in that which is more important to mankind, the discovery of principles that offer a justifiable hope of greater success in prevention and treatment of disease. It is not within our province to refer to diphtheria and its treatment or to comment upon these extensively. Suffice it to say that the same principles that have given to the world a remedy that may at least be assumed of probable value in this disease have been applied to other conditions. We cannot pass the work of Marmorek without particular notice. Whether the serum prepared by this investigator will prove itself as useful in the treatment of erysipelas and other forms of streptococcus-infection as some maintain, or not, time alone can tell. At present the evidence favors a hopeful acceptance of the claims. In small-pox, typhoid fever, tuberculosis, and other infections the results have been far less satisfactory, though flattering reports are not wanting. We have referred to the greater accuracy of knowledge regarding various diseases. This is evidenced in the advance of bacteriology and the titles of reports of cases. Pyocyaneous infection, streptococcemia, infection with the bacillus coli, etc. have taken the place of the more vague and insignificant titles—septicemia, pyemia, etc. Further investigations will doubtless establish more definite distinctions in the symptomatology and nature of the various infections; but for the present it is sufficient that they are beginning to be recognized and separately studied. Certain authors have maintained that acute rheumatism is a form of infection (micrococci), and the evidence is strong and suggestive. Reference may also be made to the positive demonstration of the gonococcus as a cause of general septicemia and of endocardiac and other metastatic lesions. Chemical investigators have been but little less active than the bacteriologists. The problems

of autointoxication and the processes of normal and disordered metabolism are beginning to be understood, and special manifestations are recognized in which specific disturbances of the organic chemistry play an important part. There is the difference between the views of the present day and those of the older authors, that demonstration has taken the place of speculation. We need only refer in this connection to the investigations regarding myxedema and the thyroid gland, to the studies of uric-acid formation, and to the investigations regarding the pathology of gout. Among other evidences of progress, attention may finally be called to the discovery of the specific cause of the bubonic plague by Kitasato, and the method of Elsner for the diagnosis of typhoid fever. These will be discussed more particularly in the appropriate sections.

INFECTIOUS DISEASES.

TYPHOID FEVER.

Essential Identity of Sundry Types.—[The difficulty of establishing an absolute diagnosis of the disease in cases which recover has led to a diversity of opinion regarding the nature of a number of diseases marked by continuous fever, such as "simple continued fever," tropical fever, thermal fever, and the forms described in various localities, such as Malta fever, Mediterranean fever, mountain fever, etc. If the bacteriologic method of Elsner proves as satisfactory as the small number of investigations now at hand would seem to indicate, greater exactness may be expected in the future; for the present, opinion usually takes the place of demonstration, excepting in occasional fatal cases, and these, according to those who maintain the existence of separate febrile diseases resembling typhoid fever, are ascribed to erroneous diagnoses.]

Matas[1] believes that the so-called **continued fevers of Louisiana** are merely mild forms of typhoid fever, basing his opinion upon the fact that they are influenced but little by the cinchona alkaloids, that they occur at all seasons of the year, and in groups apparently the result of infection from a common source. Moreover, in such epidemic cases of typical typhoid fever often develop.

Le Cato[2] identifies the **endemic fever of the Eastern Shore** with typhoid fever. Although malaria is not unknown there, he has never seen a case of typho-malarial fever as described by Woodward, and he is inclined to believe that the two poisons are so specifically distinct as to be in some way mutually antagonistic.

Etiology.—[Nothing of moment has been added to the knowledge of the bacillus of typhoid fever or its life-history.] Freund and Levy[3] record a case of intrauterine transmission of typhoid infection. The woman was attacked with typhoid fever in the fifth month of pregnancy and aborted after the fourth week. Antiseptic precautions were taken during labor, and the authors

[1] New Orl. M. and S. Jour., July, 1895. [2] Va. Med. Monthly, Feb., 1896.
[3] Berl. klin. Woch.

claim that the cervix and external genitalia were rendered practically germ-free. The fetus died immediately after the cord was cut, and 20 minutes later a bacteriologic study of the tissues was begun. Cultures were taken from the spleen, heart's blood, and placenta. A piece of the spleen was placed in nutritive broth and kept in the incubator. Cultures of the typhoid bacillus were obtained, and caused death in mice. The passage of the bacilli into the fetus through the placenta seems, therefore, to have been established. Post-mortem examination of the fetus revealed no lesions. Étienne[1] reports a case of a pregnant woman suffering from typhoid fever. During the course of the disease she aborted, and careful examination of the fetus showed that the spleen was not increased in volume and the intestines presented no lesion, all the organs being, in fact, perfectly healthy. Cultures made from the splenic and hepatic pulp and the blood upon gelatin or agar-agar developed numerous colonies of small short bacilli that gave all the characteristic reactions of the bacillus of Eberth. Stern[2] in a lecture on typhoid fever holds that **the gastric juice** can offer but slight protection in the way of destroying bacilli. Only when there is hyperacidity and hypersecretion is destruction in the stomach likely to occur. Regarding the matter of rendering germs harmless in the intestines, he found that mechanical removal by purgatives or high enemata is the surest method. In 3 of 6 cases he found the bacilli in the blood of the veins or of the spots. Acquired immunity is not due, according to Stern, to the condition of the blood-serum; nevertheless, the serum of persons who have just recovered has a certain protective value, though this varies greatly. High temperatures have no inhibitory action in the growth of the germ.

Samuel Pierson[3] reports **the epidemic** of typhoid fever that occurred in the spring of 1895 **at Stamford, Conn.** From April 15th to May 6th, 253 cases in all were reported. After this the number rapidly decreased, only 135 more cases being reported during the next 3 weeks. The total number of cases reported was 406. Nose-bleed occurred in 117 cases and rash in 360, the latter being in some cases petechial and spread all over the body. Hemorrhage occurred in 73 cases, of whom 12 died. Relapse occurred in only 26 cases; acute nephritis in 9, of which 4 were fatal. Perforation occurred 7 times with 6 deaths and 1 recovery, and phlebitis was seen in several cases. In all there were 27 deaths, being a mortality of 6.6%. No tub-baths were used during the epidemic, but alcohol and iced water sponging, and sometimes rubber-blanket baths, were frequently employed. The source of the epidemic was traced to contaminated milk, and 2 weeks after its sale was stopped there was almost complete cessation of new cases. Schavoir[4] gives a more careful account of the causation of the Stamford epidemic. The large number of children affected suggested that the milk was contaminated, and it was found that the pans in which the milk was kept were washed with

[1] Gaz. Hebdom. de Méd. et de Chir., Feb. 23, 1896.
[2] Volkmann's Samml. klin. Vorträge, 138, 1895. [3] Med. Rec., N. Y., Dec. 7, 1895.
[4] Ibid.

water from what is known as a "dug well;" that is, one walled up with stones, not cemented, and covered with a loose board platform 6 inches above the ground, the well itself being only 13½ feet deep. All the houses in the vicinity were provided with privies. The original cause of the typhoid fever could not be definitely made out, but there seems no doubt it originated in this well; 140 cases occurred in children under 10 years of age, 68 of these being under 5 years of age.

Symptoms.—Atkinson[1] reports an interesting case of typhoid fever, commencing apparently with a paronychia and abscess in the hand, but subsequently marked by high temperature and violent delirium. Typhoid fever was suspected when hemorrhage from the bowels occurred, but there were no rose spots or other of the typical signs of the disease. Death occurred on the 21st day, and at the autopsy the characteristic lesions of typhoid were discovered. [It is to be regretted that no bacteriologic examinations were made of the pus from the palmar abscess. It is very unlikely, however, that this lesion was of particular significance.]

Osler[2] refers to **chills occurring in the course of typhoid fever.** Among 79 cases treated during 1 year, there were 13 in which the disease began with shaking chills. In 2 cases there were several severe rigors, in 3 cases there were 2, while in 8 the rigor was single. Similar rigors occurred in a number of instances at the onset of relapses. A number of cases are recorded in which the chills resulted from treatment. Among these causes were antipyrin, injections of sterilized typhoid bacilli, and external applications of guaiacol. Several cases presented chills at the onset of various complications, and distinctly septic (?) chills occurred during convalescence in severe and protracted cases. One instance is reported in which the patient had suffered with malarial fever for 11 days after convalescence, from which typhoid fever set in with characteristic symptoms, and a chill occurred at the height of the fever. The attack of malaria lasted from Sept. 23d to Oct. 7th; she had frequent chills, and organisms were found in the blood. On Nov. 6th she entered the hospital with all of the symptoms of typhoid fever, but blood examination was negative. On the 7th she had a chill of moderate severity, but not followed by any rise in temperature. The blood was not examined during the chill, but repeated examinations subsequently were always negative. In no instance among 333 cases of malaria and 389 of typhoid fever were the two diseases concurrent. [Reference should here be made to the report of Gilman Thompson; see *Year-Book*, 1896.]

Day[3] describes a case of typhoid fever in which **a rash** somewhat resembling that of typhus fever or the prodromal stage of small-pox occurred. In this instance the eruption was abundant on the chest, abdomen, and back, less marked on the limbs, forehead, and face, but absent on the hands and feet. It consisted of more or less irregular patches, dark red in color, in some places presenting the appearance of groups of ordinary spots, but darker in color.

[1] Va. Med. Monthly, March, 1896. [2] Univ. Med. Mag., Nov., 1895.
[3] Dublin J. of M. Sc., Mar., 1896.

The eruption was raised and soft, and disappeared on pressure. The spots did not correspond to petechiæ, though some left pigmentation after their disappearance. The author states that he has seen at least 10 similar instances. In 4 the subsequent of intestinal hemorrhage was foretold by the occurrence of these eruptions in association with high fever, rapid pulse, distended abdomen, and clear intellect. It is therefore of considerable importance in prognosis.

Stevens[1] reports a case of typhoid fever, with **hemorrhagic nephritis** and uremic symptoms that were relieved by profuse hemorrhage from the bowel. In the course of convalescence a severe attack of rhachialgia occurred.

Zienetz[2] reports a series of cases in which **albuminuria** occurred in cases of typhoid fever. Among 342 cases of this disease, death occurred in 39 and relapses in 11. These cases being excluded, the remaining 292 may be divided into those in which albumin never appeared in the urine, in which group there were 118 cases, and those in which albumin did occur—174 cases. The latter may be divided into cases in which the fever ran its course in 1, 2, 3 weeks, or more. Of the cases terminating in 2 weeks, 31 showed albuminuria, 23 no albumin. Of the cases of 3 weeks' duration, albumin was absent in 37 and present in 57. Of the cases lasting 4 weeks, albumin was wanting in 29 and present in 51. Of the cases of 5 weeks' duration, albumin was wanting in 15 and occurred in 27. Of those lasting 6 weeks, there were only 2 without albumin and 12 with albuminuria. In the group of cases of 7 weeks' duration, albumin was present in 3 and absent in 3. In 1 case lasting 8 weeks albumin was absent. Among the 11 cases in which relapses occurred there was albuminuria in 5, and among the 37 fatal cases it was present in 35. The author does not believe that the diet plays as conspicuous a part in the occurrence of albuminuria in typhoid as certain authors have held. [It has seemed to us that the frequency of albuminuria in the cases of typhoid fever under our care in the last two years has been much greater than formerly, though we have made no extended analyses. Several cases have been of the type in which the renal manifestations were striking from the first, and in which blood-casts and free blood are found in the urine. This may, of course, be coincidental, but the suggestion has repeatedly occurred to us that the prevalence of influenza in recent years is of some importance in this connection.]

Delvic[3] considers **ulceration in the mouth** quite common in typhoid fever. It affects the anterior pillars of the pharynx most frequently, but the sides of the tongue and anterior surface of the soft palate and the tip of the tongue may be affected. The ulceration is always superficial, oval or round, and the edges regular and not undermined. As a rule, there are no symptoms, the ulcerations being indolent and only found when looked for. The author agrees with Tripier that these ulcers run a parallel course with the intestinal lesions, and he regards them as important in furnishing an accessible guide to

[1] Univ. Med. Mag., May, 1896. [2] Wien. med. Woch., Jan. 1, 1896.
[3] Prov. méd., No. 50-51, 1895.

the condition of the intestines. The progress of the case may be judged and the relapses may be predicted by the observations of these ulcers. He finds them in about one-sixth of the cases. [One of the editors is able to confirm this observation to a certain extent, having found erosions corresponding more or less accurately with the descriptions given above in a number of cases of typhoid fever. The lesions, however, have been extremely superficial, and in no sense characteristic of the disease. Other febrile disorders presented the same peculiarity.]

Osler [1] has observed extreme **tenderness of the toes** in 3 cases of typhoid fever, and believes that it should be classified as a neuritis.

Sweet [2] reports 31 cases of typhoid fever that were observed in the Napier Hospital during the past year. The majority of these occurred during the months of February, March, and April, but cases were present during the whole year. The average duration of the disease during the period under observation was 13½ days, the maximum period being 55 days. In 22 cases deep rose-colored spots were observed, and in about two-thirds of these there were repeated eruptions. Violent delirium occurred in 2 cases and muttering delirium in 5. Hemorrhages occurred in 4 cases, 2 of them having repeated attacks; relapses occurred in 2; in 4 cases there was thrombosis of one femoral vein; in 2 cases severe subcutaneous abscess occurred. There were no deaths. The treatment employed was chlorin or sulphurous acid. The most severe case occurred in a girl of 16, in whom the temperature remained above normal for 55 days with a maximum of 104.2°. She had repeated hemorrhages from the bowel, and diarrhea persisted for 6 weeks after the temperature reached normal. Emaciation was extreme and convalescence very slow.

Morse [3] has studied the **cases** of typhoid fever occurring in children under 15 during 13 years **in the Boston City Hospital.** The total number was 284, being 7.07% of all the cases treated during that time. He concludes that it is a common disease in children, though rare below the age of 2. The mortality in the cases under 15 is about 6%, but increases directly with the age. The course is shorter and less severe than in adults, but the onset is acute in about one-third of the cases in the first 5 years of life, and in one-fifth of the cases in the next 5 years. In general the clinical history is practically the same as in adults, but crying at night and meningeal symptoms are common, and marked nervous symptoms of some kind occurred in at least 25%.

Musser [4] reports a case of typhoid fever in which the **temperature** did not reach normal until 73 days had elapsed. There was no complication of any kind.

Complications and Sequels.—Creagh [5] reports an interesting case of typhoid fever in a non-phthisical patient in which hemoptysis occurred as a

[1] Johns Hopkins Hosp. Rep., v., Nos. 6, 9, 1895.
[2] New Zealand Med. Jour., Dunedin, Jan., 1896.
[3] Bost. Med. and Surg. Jour., Feb. 27, 1896.
[4] Univ. Med. Mag., Nov., 1895.
[5] Lancet, Lond., Nov. 30, 1895.

complication, and proved fatal on its recurrence. The patient, a man of 35, had been well with the exception of an attack of what was regarded as rheumatic fever some time previously. The first attack of hemoptysis occurred on the 16th day of the disease, no evidence of cardiac or of a serious pulmonary disease having existed. There were, however, signs of rather marked bronchitis. The patient died on the 17th day. Considerable cyanosis was noted. The patient's history gave no evidence of phthisis or hemophilia. The author remarks that he has been unable to find records of hemoptysis as a complication of typhoid fever in the text-books. [Cases of this character occur occasionally, and may be of different sorts. Unfortunately, no autopsy was made. We have ourselves seen a case in which serious hemoptysis occurred in a patient suffering with typhoid fever, and in which the autopsy showed the cause to be pulmonary thrombosis. Such an explanation might be applicable to the present case. It is also to be remembered that a marked hemorrhagic tendency may be developed in typhoid fever, and hemoptysis may be the expression of this diathesis. Thus in one of our cases death occurred from uncontrollable epistaxis and hematemesis in the second week.]

Lannois[1] observed a case of **abscess of the liver** following typhoid fever in which the pus of the abscess contained the bacillus of typhoid. He divides abscesses of the liver following this disease into those due to metastasis, those due to typhoid ulceration of the biliary passages, and those due to pyelophlebitis. His own case belonged to the last group, and occurred in a patient who had been afebrile 3 days at the end of the attack of typhoid fever. He was then taken with renewed fever, followed by swelling of the abdomen, pain in the right side, and the signs of pleurisy at both bases. Three days after this the patient died, and partly healed ulcers were found within the ileum. Adherent clots were found in the portal, the inferior mesenteric, and the splenic veins, and in the liver were seen a number of abscesses. From the pus of the latter several varieties of organisms were obtained, and one of these closely resembled that of typhoid fever, though it differed slightly in some of its cultural properties.

Pansini[2] reports a case of **thrombosis of the iliac veins** and of the lower part of the ascending cava following typhoid fever, with peritonitis; edema, lividity, pain, and loss of power were among the significant symptoms. The author refers to the statistical article of Vimont, who was able to collect 112 cases from literature up to the year 1890. The diagnosis of the seat of the thrombosis is aided by the knowledge of the collateral circulation. The venous systems of the superior and inferior cavæ are united by anastomoses of the superior diaphragmatic veins with the inferior by the vertebral veins, both anterior and posterior; the greater and lesser azygos veins and the intercostal, lumbar, and sacral veins belonging to the anterior plexus; by the veins of the abdominal walls, the epigastric vein, and external pudendal below, and the external mammary and intercostal veins above; finally, by certain branches of the portal veins, those which become enlarged in cirrhosis of the liver.

[1] Rev. de Méd., Nov., 1895.

[2] Centralbl. f. innere Med., June 6, 1896.

Quervain[1] describes a case of **gangrene** following typhoid fever. The author quotes the literature, showing that this condition is one of great rarity. His own case occurred in a man aged 25, previously healthy, who had an attack of typhoid fever of moderate severity. Severe pain in the right leg, followed by pallor of the feet and lower limbs and diminished sensibility and coldness, occurred. The pain became intense and the pulse and temperature increased. Slight edema and great pain in the popliteal space followed. Later loss of motion and sensation, then cyanosis and gangrene, occurred. Amputation above the knee was performed. Slight phlebitis occurred in the left leg, and examination of the amputated limb showed a rather firm thrombus in the popliteal artery and many of its branches.

Parsons[2] reports 6 cases in which **bone-lesions** were found after typhoid fever. These lesions appear from 1 to 16 months after the fever, and the author finds but 1 case in literature in which it occurred during the fever. The tibia is most frequently involved, while the hands and feet are especially free. The ribs and costal cartilages are frequently involved. The symptoms are pain, usually localized to the seat of subsequent necrosis and resembling syphilis; subsequently swelling and perhaps necrosis, though resolution without necrosis may occur. In 5 of the cases bacteriologic examination was made, and typhoid bacilli were found in pure cultures 4 times, and associated with staphylococcus pyogenes citreus in the 4th case.

Tuffier and Widal[3] report 2 cases of typhoid fever in which, one month after convalescence, various **tumors** occurred **in** connection with **the long bones** and were found to contain pus. In both cases the pus was sterile, although careful cultures were made on various media.

Himmelsbach[4] has observed 3 cases of typhoid fever **complicating pregnancy** at periods of from the 3d to the 5th month. Each of these was treated with cold baths, and all at the onset presented a grave type of fever, but responded quickly to the baths without interference with the pregnant state.

Simpson[5] records a case of typhoid fever followed by unusual **nervous sequelæ.** The patient, a woman of 45, was healthy until she was 28, when she contracted typhoid fever. During the convalescence she became suddenly unconscious without warning, the limbs became rigid, and the face pale. There was no clonic period to the attacks, which were repeated as often as five times daily. After the seizure she was dazed, and during the attack she sometimes bit the tongue and had involuntary micturition. She was confined to bed for 9 years, at the end of which time there was gradual improvement, though she had regular attacks on Sunday (the day on which the first fit occurred) and was sometimes confined to bed. Attacks of vomiting were sometimes severe, and the patient's mental condition was undoubtedly affected.

Diagnosis.—[We have already taken occasion to remark upon the neces-

[1] Centralbl. f. innere Med., No. 33, 1895.
[2] Johns Hopkins Hosp. Rep., vol. v.
[3] Gaz. Hebdom. de Méd. et de Chir., April 2, 1896.
[4] Buffalo Med. Jour., Aug., 1895.
[5] Edinb. Med. Jour., Jan., 1896.

sity of greater accuracy in the methods of diagnosis at the present time. In typical cases running a typical course the practitioner finds little difficulty, but in atypical, irregular, or abortive cases, and in some of the febrile affections variously regarded as typhoid fever or as independent affections, the need of more accurate means of diagnosis is keenly felt by the most experienced clinicians. Unfortunately, the bacteriologist has hitherto given little aid, and the chemical examinations of the urine and other clinical methods have been unavailing in doubtful cases. The hematologist has aided somewhat in determining the absence of leucocytosis, but the same occurs in other febrile diseases. The method of Elsner, alluded to in the following abstracts, seems to hold out greater hope of value than any of the bacteriologic procedures thus far suggested. Nothing, however, can be concluded from the small number of cases at hand. Time and further investigations will show how far this method is reliable; at the present we can only look upon it as hopeful.]

Lazarus[1] has investigated the merits of **Elsner's method** of diagnosis of typhoid fever. This method consists in the preparation of cultures from water, food, or soil, or from the stools of patients suffering from typhoid fever, upon a special culture-medium. The latter is composed of Holz's acid potato-gelatin with 1% of potassium iodid. Upon this medium only a few forms of bacteria will grow, and among these the bacterium coli and the typhoid bacillus. The investigations of Elsner showed that the bacillus of typhoid fever may be readily distinguished from the bacillus coli by his method. In contradistinction from the last-named form, the colonies of typhoid bacilli are slow in growth and scarcely visible under low powers for 24 hours, whereas the coli colonies show a considerable growth at this period. After 48 hours the typhoid cultures present themselves as small glistening aggregations having the appearance of drops of water with finely moulded structure. The coli colonies are larger, much more granular, and brownish in color. Only in cases in which the plates are richly covered with colonies, and in which the number of colonies prevents active growth, do the coli colonies resemble those of typhoid. On the plates prepared so as to reduce the number of colonies mistakes of diagnosis can scarcely occur. Elsner[2] found in 17 cases of typhoid fever that pure cultures of typhoid bacilli could be obtained in 15. The 2 negative cases are unimportant, as 1 of these was not examined until the 7th week, and the other only 2 days before complete defervescence. The present author (Lazarus) has studied 5 cases of typhoid fever in the active stage and 16 in various stages of convalescence. Among the 5 cases of the first group typhoid colonies were obtained without difficulty in a number of trials. In many cases the diagnosis was made in 48 hours; in only 1 case the characteristic colonies were not obtained until the 3d day. In convalescent cases among those which had been without fever from 3 to 6 days, only 3 showed typhoid bacilli in the stools after repeated examinations. In no instance in which the stools of other cases were examined could colonies of the same kind be de-

[1] Berl. klin. Woch., Dec. 9, 1895. [2] Zeit. f. Hyg. u. Infectionskrankh., Bd. xxii.

tected. Chantemesse[1] advocates Elsner's method of examining the stools for typhoid bacilli for the early diagnosis of the disease, and reports cases. At first 3 were examined, once each, with negative results, but there were errors of technique. Subsequently 13 cases were examined with positive results. By this means the diagnosis was made at the 7th day in 8 cases; at the 8th, 12th, and 13th day in 1 case each; at the 17th day in 2 cases; at the 20th day in 3 cases; and at the 19th, 21st, 23d, and 26th days in 1 case each. In 3 of the cases the diagnosis would otherwise have been doubtful.

Walthalet[2] made repeated examinations of stools in 12 cases of typhoid fever, and was able in a small number of his trials to develop cultures of the typhoid bacilli. As a rule, the bacillus coli grew with such rapidity that the specific form was not discovered. It is evident that the ordinary bacteriologic examination of the stools can serve but little purpose for diagnosis.

Semple[3] examined **the urine** of 7 cases of typhoid fever bacteriologically, and was able to demonstrate the specific bacilli in 6. He therefore urges careful disinfection of the urine in every case.

Prognosis.—Day[4] refers to a peculiar **dark-red rash** resembling that of typhus fever or of the prodromal stage of smallpox as an indication of prognostic value in typhoid fever. In 4 cases this rash with rapid pulse, high fever, distended abdomen, and clear intellect presaged intestinal hemorrhage.

[A number of **statistical articles** have appeared during the year, and deductions regarding the value of treatment, the prognosis under varying conditions, etc. have been made. Undoubtedly, the number of cases upon which such conclusions are usually based does not warrant positive deductions. Nothing is more certain than the fallacy of statistics, and discriminating readers will always look askance at extravagant claims based upon such evidence. On the other hand, the experience of careful and conservative observers must always have a certain measure of authority, even beyond the limits that the absolute rule of chance would warrant. Personal judgments of known authorities are always important.] Prince[5] points out that a considerable number of cases are necessary to render statistics regarding typhoid fever reliable. It would appear from his figures that the element of chance can only be eliminated when the number of cases is from 800 to 1000, and an equal number of cases is required to obtain a standard of mortality of different forms of treatment. [Other writers, as Wieland, have given even larger figures than the above, but we need not enter upon the discussion in greater detail at the present time. The following article may, however, be referred to in the same connection.] Simon[6] gives statistics to prove that typhoid fever is now more benign, or at least that the death-rate is diminishing, and that therefore statistics of various methods of treatment are apt to be fallacious.

Treatment.—[The **Brand method** of cold bathing has been attacked with much vigor by a number of writers in the last year or two. Some of

[1] Compt. rend. de la Soc. de Biol., Mar. 6, 1896.
[2] Ann. de l'Inst. Pasteur, No. 4, 1895.
[3] Lancet, Lond., July 27, 1895.
[4] Dublin J. M. Sc., Mar., 1896.
[5] Bost. Med. and Surg. Jour., Oct. 17, 1895.
[6] Birmingh. M. Rev., May, 1896.

these have urged other methods; some advocate expectant measures; some have not hesitated to put forward plans of treatment as capable of aborting the disease. It is noteworthy that the experience of those who have recorded the results of treatment in large hospitals has with great uniformity been favorable to the Brand method. Collected cases gathered from all possible sources in support of some special form of treatment, and for the most part inadequately reported, do not compare in reliability with the other kind of evidence. Our own experience is wholly on the side of those who maintain the value of cold bathing; and, though we agree with Osler and other conservative advocates of the method that it is unnecessary or perhaps inadvisable to insist in every case upon this plan of treatment, there is no doubt in our mind that the mortality has been greatly reduced wherever the treatment has been properly carried out. This has been true of our own experience, and in addition the cases have been strikingly less severe and troublesome since we have adopted the treatment. Untoward results undoubtedly occur, but it is no more necessary to exercise judgment in the use of the Brand method than in carrying out any other form of treatment. The element of judgment cannot of course be neglected.] Osler[1] reports the statistics of **Johns Hopkins Hospital** in typhoid fever. During the six years ending May 15, 1895, 389 cases were admitted, 34 died, giving a mortality of 24.2%. Of these, 33 were treated medically, with 8 deaths; 299 cases were treated by the baths, of whom 20 died, a mortality of 6.67%. Of the remaining cases, the majority were admitted late with falling temperatures, some never developed very high fever, and a third group presented serious complications, such as hemorrhages or perforation. Of these 57 cases not bathed, 6 died. He concludes that the cold-bath treatment rigidly enforced appears to save 6 to 8 in each 100 typhoid patients. Osler himself is inclined "to pray for a method which may be, while equally life-saving, to put it mildly, less disagreeable."

J. C. Wilson[2] reports upon his experience at the Pennsylvania Hospital with systematic cold bathing in the treatment of typhoid fever. Among 71 cases under his care, the Brand method was used in all but 5, and the number of deaths was 4, or a mortality of 6.3% in the 63 cases (8 being still in the wards, and therefore excluded). Of the cases that recovered, 3 were not bathed, and of the fatal cases, 2 were not treated in this way. Deducting these 5 cases, there were 2 deaths in 58 cases, a mortality of 3.4%. The author points out that a series as small as this one does not justify positive conclusions. In his experience at the German Hospital the mortality varied in different groups; thus there were 40 cases without a death, then 54 with 1 death, 66 with 7 deaths, 66 with 4 deaths, 74 with 8 deaths, and, finally, 108 with 12 deaths. Among the 71 cases of the present series relapses occurred in 5, and all of these recovered. Perforation occurred in 3 cases, but the conditions prevented surgical interference. The average stay in the hospital of the cases which recovered was 35.5 days. Five of the cases were of short duration, the history indicating an illness of less than a week before

[1] Med. News, Oct. 12, 1896.

[2] Ibid., Nov. 30, 1895.

admission, and defervescence being complete in 5 to 7 days. Benedict[1] makes a violent attack upon the Brand method of treatment. He claims that bathing produces a depression which is something more than the mere abstraction of heat-units, and that it is fair to doubt the good faith of those who practise immersion in hospitals, but do not urge it on their private patients. [He offers no other valid arguments.] Baruch,[2] in reply to Benedict's article criticising the Brand treatment, quotes statistics involving many thousand cases, which show that the mortality has on the average been reduced from about 20 to about 7% by this method. Patek[3] also makes a vigorous reply to Benedict's criticism of the Brand treatment, denying, in the first place, the depressing effects of bathing, and, in the second, the production of internal congestion.

Simon[4] discusses **the treatment** of typhoid fever at great length. He concludes that it should be essentially rational, and that we have no specific remedial agent. He prefers turpentine to the other intestinal antiseptics that have been suggested. Of 304 cases in his own service with 51 deaths, 22 were apparently due to toxemia and 29 to other causes. Even supposing that the Brand method could have prevented some of the deaths of the former group, he urges that we must still have better proof of its benefits before it could be universally adopted.

Hotchkiss[5] reports a case of typhoid fever with **intestinal perforation** in which **surgical operation** was undertaken. Incision in the middle line was made and a large amount of serous liquid was removed; the perforation was found 5 inches above the valve, and the area around this was turned in longitudinally more than an inch and sutured. A hot salt solution was used to flush out the abdominal cavity. The patient died after four hours. The author points out that of 17 cases reported 3 only have been successful. Nevertheless, the operation is justified and offers some hope.

[The attempts to apply the methods of **serum therapeutics** to this disease have thus far met with little encouragement. The following investigations, however, are sufficiently interesting to deserve further prosecution.]

Chantemesse[6] in his paper on the value of Elsner's method of diagnosis refers to his experience with serum injections. These cases were injected with serum from a horse that had been rendered immune to the typhoid bacillus, and in all a steady fall of temperature occurred such as takes place in abortive typhoid. Klemperer and Levy[7] contribute experiments to show the possibility of rendering animals immune from typhoid infection, or of curing the disease when infection has already occurred, by injection of serum of immunized dogs. The serum was used in 5 patients, each in the first week. The subsequent course of the disease showed no striking results, but all of the cases went on to convalescence as mild typhoid fever. They believe the serum may have

[1] Med. News, Feb. 8, 1896.
[2] Ibid., April 25, 1896.
[3] Ibid., May 23, 1896.
[4] Brit. Med. Jour., Mar. 21, 1896.
[5] N. Y. Med. Jour., Jan. 11, 1896.
[6] Compt. rend. de la Soc. de Biol., Mar. 6, 1896.
[7] Berl. klin. Woch., July 15, 1895.

had the effect of making the disease milder and shorter than would have been the case, but do not make positive assertions.

Henshaw[1] has prepared a bouillon with **calves' thymus** which he has inoculated with typhoid bacilli. This he sterilized at 63° C., and then injected it into cases of typhoid fever. The initial dose is 1 to 2 c.cm., increasing up to 5. He reports in all 13 cases, in which the results in 8 were as satisfactory as could be desired; in 4 no effect was noticed, and there was 1 death from hemorrhage. In connection with other cases recorded in literature he is able to report a total of 98 cases of typhoid fever treated by this method, and, when the treatment has been started reasonably early, there has not been a single death as yet recorded. He believes it is desirable to use a more concentrated and stronger culture.

Clemow[2] reported before the Clinical Society of London a case of typhoid fever in which a severe rigor, followed by a temperature of 106.7° and delirium, occurred on the 14th day. Ice-sponging failed to control the fever and other symptoms; the patient became deeply cyanosed, and was apparently *in articulo mortis* when **venesection** was performed, 8 oz. of blood being removed. Improvement began at once, and eventually the patient recovered.

Abortive Treatment.—A number of such methods are suggested. That of Woodbridge has attracted more attention in this country, but others are offered with the same flattering statistical evidence. Woodbridge[3] contributes elaborate papers upon his abortive treatment of typhoid fever, which consists in the administration of podophyllum, calomel, guaiacol, eucalyptol, and menthol according to certain definite formulæ. The number of instances reported to him by different physicians are included to illustrate the possibility of aborting this disease by the method of treatment recommended by the author. None of these cases seem to have been studied in hospital practice.

Shields[4] reports 28 cases of typhoid treated by **the Woodbridge method,** with 1 death, a patient who had persisted in eating solid food. In addition to the regular method, he employed sponge baths and rectal injections of boiled water and carbolic acid. The average duration of 23 of the cases was 15½ days. The other cases did not appear to benefit by the treatment. He concludes that the results have not been as good as is claimed by Dr. Woodbridge, but that the remedies have a markedly beneficial effect upon tympanites, relieving it in a few days. He believes that lavage of the stomach and rectal injections are of great assistance. In a case benefited by the Woodbridge treatment aggravation occurred when it was intermitted. Schoenfeld[5] reports 5 severe cases of typhoid fever treated by the Woodbridge method without a death, and with results that he does not believe possible by any other method. Orton[6] reports 8 cases of typhoid fever treated by Woodbridge's method with no deaths. In 12 cases treated by other methods there were 3 deaths. Quine[7]

[1] Bost. Med. and Surg. Jour., May 14, 1896.
[2] Brit. Med. Jour., May 30, 1896.
[3] Jour. Am. Med. Assoc., July 13, Aug. 10, et seq., 1895.
[4] Ibid., April 11, 1896.
[5] Ibid., May 23, 1896.
[6] Ibid., Feb. 1, 1896.
[7] Ibid., May 23, 1896.

reports 21 consecutive recoveries under a modified Woodbridge treatment, but he warns against too great reliance on statistics, on the ground that the disease has been growing more mild of late. Duffield[1] reports 16 cases of typhoid fever; of these 3 were treated by bathing and antipyretics. The average duration of the fever was 6.1 days, the maximum period of duration being 9.6 days; 13 cases were treated exclusively by the Woodbridge method. The average duration of fever in these cases was $13\frac{7}{8}$ days. Sponge baths, however, were also employed whenever the temperature reached 103°. No examinations for bacilli were made, and clinical histories are not given. In 1 case the temperature reached normal on the 5th day of treatment, and the patient is said to have been sick for 3 or 4 days before admission. A serious case occurring during the puerperium received, in addition to the Woodbridge treatment, plunge baths, sponge baths, and cold packs. Two cases are reported as having been aborted, 1 on the 7th day and 1 on the 13th day. All the cases but 1 are said to have had rose spots. [The above reports indicate the claims made for various plans of treatment from time to time. We may refer to the following criticism of Osler as indicating the conservative view of the value of most methods. A greater minuteness of attention to diagnosis might frequently be desirable in the reports of brilliant results.]

Osler[2] in an address upon **the fevers of the South** takes occasion to say that the advocates of the abortive and antiseptic treatment of typhoid fever must bring forward a much stronger body of evidence than has been presented, and in a much more rational way, before they can hope to carry conviction to the skeptic. He agrees with Woodward in his contention that typhoid fever may coexist with malarial infection, and goes on to discuss a certain peculiar continued fever that occurs in the South, and that is apparently neither typhoid nor malaria, but appears to be a disease of itself. [Other methods of treatment seem to enjoy the reputation urged for the Woodbridge plan, as the following references sufficiently indicate.]

Bignami[3] claims to have obtained excellent results from the treatment of typhoid fever by **phenacetin.** Among 200 cases in private, only 6 died, and in these cases disobedience or poor surroundings affected the result. He gives from 1 to 3 gr. every 4 hours at first, later $7\frac{1}{2}$ gr. regularly every 6 hours.

Thistle[4] believes that the proper treatment of typhoid fever is by **catharsis,** preference being given to calomel in $\frac{1}{2}$ gr. doses frequently repeated. He reports 172 cases with a mortality of 5. In no case did death occur either from toxemia or from perforation.

Wilcox[5] advocates the use of **chlorin-water** in the treatment of typhoid fever, holding that this remedy may be safely administered until complete disinfection of the alimentary canal is obtained. Under its use he finds improvement in the gastrointestinal conditions, in the general strength and nervous

[1] Physician and Surgeon, April, 1896. [2] Jour. Med. German Assoc., May 23, 1896.
[3] Gaz. d. Osped., Mar. 21, 1896. [4] Med. Rec., Sept. 14, 1895.
[5] Amer. Jour. Med. Sci., Sept., 1895.

symptoms, and a shortening of the duration of the disease. The author includes 4 case-histories. [The number of cases recorded does not permit expression of positive opinion, and as the author states that he does not employ the remedy until ulceration has been established and systemic infection has become marked, it would seem difficult to assert that it has power to shorten the duration of the disease. Regarding his statement that it secures complete intestinal antisepsis, we need only allude to the uniformly contrary results obtained by all experimenters who have studied this question. No systematic studies of the urine or stools were made in this case to determine positively that antisepsis was secured, his opinion being based apparently entirely upon the loss of odor of the stools.]

TUBERCULOSIS.

[Little has been added to previous knowledge of this disease by the contributions of the past year. A number of communications upon the treatment have been published, and some of these contain flattering statistics. Upon the whole, however, there is little sure evidence of progress. Serum-therapy has been lauded and certain preparations have been extensively used. The evidence, however, justifies no deductions. More laboratory and less clinical work in this direction are desirable.]

Etiology.—Bowditch [1] urges that too great terror has been excited by the efforts of the profession to convince the laity of the contagiousness of tuberculosis. He maintains that the only source of infection is the sputum, and that when this is properly destroyed even hospitals for consumptives are not sources of danger to a community, but, on the contrary, really a protection. Heffron [2] suggests compulsory registration of every case of tuberculosis and the prevention of contamination by expectoration in public places. Vaughan [3] takes a similar position, and advocates the prevention of the sale of **meat and milk from tuberculous animals** and the disinfection of the sputum and other excretions from the diseased human body.

Wells [4] claims that a careful study of the **statistics** shows that pulmonary tuberculosis has decreased in prevalence during the past, and that the tendency is toward still further reduction, although in the case of the United States there is apparently an increase at present.

Cornet [5] in a contribution on the **prophylaxis** of tuberculosis points out that the disease is growing decidedly less frequent in Prussia than formerly, and concludes that in that state, during the period of 1887 to 1893, 70,000 less persons died of tuberculosis than would have been expected from the mortality tables established by earlier experience. Hinsdale,[6] on the contrary, shows that the **death-rate** from tuberculosis in the city of Philadelphia has gradually diminished since 1880, there being 342 from this cause to 100,000 of population in 1870; 317 in 1880; 264 in 1890; 220 in 1894. The same

[1] Bost. Med. and Surg. Jour., June 25, 1896.
[2] Med. News, Feb. 15, 1896.
[3] Ibid., Mar. 7, 1896.
[4] Jour. Am. Med. Assoc., Feb. 8, 1896.
[5] Berl. klin. Woch., No. 20, 1895.
[6] Med. News, Aug. 24, 1895.

decrease has also taken place in New York. Bollinger[1] contributes an interesting study of the mortality of pulmonary tuberculosis in various parts of Germany, and finds that there is a decided decrease, especially in the large cities (Vienna, Berlin, Hamburg, and Munich). He was able to establish this fact, not only from statistical evidence, but also in the postmortem room, and he admits the improved state is due to better sanitation as well as to prophylaxis.

Audvord[2] has studied the distribution of **tuberculosis in Norway.** He finds that below the age of 15 years but one-third of the cases of tuberculosis were pulmonary. In this period occurred nearly all the cases of tubercular meningitis and more than one-half of tuberculous scrofula. There did not seem to be any particular indication that tuberculosis was more common in the city than in the country, the figures for the different districts and different cities being very variable. Meteorologic conditions, however, played a more important part, sudden and irregular variations of the temperature and high winds being particularly favorable to the prevalence of tubercular conditions.

Otis[3] believes that the best means of protecting the nontuberculous members of a community is by providing **special hospitals** for patients suffering from phthisis, and that the patients themselves have much greater chances of recovery in such institutions. He quotes various statistics to show that such hospitals are rarely sources of contagion, urging particularly the small mortality among the attendants. A further advantage consists in the opportunity for more careful and thorough study of tuberculosis, both clinically and pathologically. He particularly deplores the attempt to attract patients to certain of these hospitals by specious claims of specific methods of treatment.

Hance[4] has repeated Cornet's experiments, collecting **the dust from the floors and walls** of the various buildings at the sanatorium for consumptives, suspending it in sterilized water, and inoculating a number of guinea-pigs. Of 81 animals used, 5 developed tuberculosis, being half of the number injected with the dust from a cottage in which a patient had been reported for carelessness. Four of the pigs died of various infectious diseases, and the remainder were healthy. He concludes that it is perfectly possible to avoid all danger of contagion. Jaccoud[5] reports 3 exceedingly interesting cases that were admitted to his service suffering from recent accidents. All 3 patients, although apparently perfectly healthy at the time of admission, subsequently developed tuberculosis. He discusses at length the question of infection at the hospital, and concludes that, although it cannot be positively asserted, it is not improbable. He believes, however, that it is important to protect hospital patients against the bacillus, which may be accomplished by careful hygienic regulations and the abolition of dust. In the discussion that followed, Nocard reported 2 cases from his veterinary experience in which tuberculosis, arising from exposure in an infected stall, seemed certain. Péan

[1] Schwindsuchtsterblickheit, etc., München, J. T. Lehmann, 1895.
[2] Rev. de la Tuberculose, Apr., 1896.
[3] N. Y. Med. Jour., June 13, 1896.
[4] Canadian Pract., Jan. 11, 1896.
[5] Revue de la l'Acad. de Méd., Jan., 1896.

reported 3 cases from his service in which tubercular infection occurred in wounds that had been received accidentally. Dumont Pallier spoke upon the other side, and doubted if the death-rate of tuberculosis was lower in those wards where precautions were taken than in those in which they were neglected.

Kempner[1] has studied the question of tuberculosis **in young infants** under the guidance of Bollinger, and concludes that only in exceptional instances is the tuberculosis of infants a congenital infection; in the majority of cases it is due to postfetal infection.

Bar and Renon[2] have collected **placental blood** in 5 cases from tubercular women, and inoculated guinea-pigs with it, in 2 cases with positive results; in 3 with negative. Of the positive cases, 1 child was born dead, and another died of pneumonia shortly after birth.

Solly[3] contributes a paper on the influence of **heredity** on phthisis, basing his remarks on 250 cases. Among these there was a family history in 139 (parental, 72; grandparental, 19; collateral, 48) and 111 acquired cases. Regarding sex, 72.8% were males and 27.2% females, 52.7% of the males and 65% of the females exhibiting a family tendency. The author holds that a connection between phthisis in an individual and phthisis in the family may be exercised in one of three ways—viz. by inheritance of bacilli, by inheritance of susceptibility, or by contagion.

Holladay[4] reports an **epidemic of acute phthisis** that occurred in a narrow valley in Virginia. In all the patients there was a possibility of contagion, 3 of the patients being sisters and living in the same house. Of the 7 cases, 3 made complete recoveries, 1 a temporary recovery, and 3 died.

Symptoms.—Maragliano[5] holds that tuberculosis may occur in a permanently latent form—that is, without ever becoming active. On the other hand, the disease may be latent for a time and then be followed by active manifestations, or may be intermittently latent. In the last group he includes cases of recurrent bronchitis in apparently nontuberculous persons. **Masked tuberculosis** may be of two forms—one accompanied by fever, sometimes of considerable degree, and sometimes attended by gastrointestinal symptoms and other appearances of typhoid fever; the second form, unattended by fever, but of dystrophic type, characterized especially by general malaise, wasting, etc. In the first group he includes the so-called "growth-fever" of young adolescents. He believes the febrile group of cases to be due to the action of the proteids of the bacilli, while the dystrophic symptoms are due to toxins. In the diagnosis he relies upon the evidence obtained by injecting tuberculin, stating that among 32 persons apparently in good health a reaction was obtained in 9%, while among 47 subjects who gave a tuberculous family history, and who had themselves suffered with repeated bronchitis, a reaction occurred in 23%. The mere occurrence of fever after the injection does not seem to be

[1] Beiträge zur Aetiologie der Saeuglingstuberkulose, München, J. T. Lehmann, 1894.
[2] Compt. rendus de la Soc. de Biol., July 5, 1895.
[3] Am. Jour. Med. Sci., Aug., 1895.
[4] Va. Med. Semi-monthly, May 8, 1896.
[5] Gazz. degli Osped., April 18, 1896.

sufficient to indicate tuberculosis; there should be in addition some local lesions of a suspicious character. If, however, definite reactive signs are found with doses below 10 mg., he would admit the presence of tuberculosis.

Leith [1] reports a case of a man 53 years of age with tubercular family history, slight cough, and scanty expectoration. His sputum presented the appearance of an almost pure artificial culture of the tubercle bacilli. Under climatic and other treatment he gained greatly in strength and weight and the bacilli apparently steadily diminished in numbers. After 4 years his condition was as good as upon the first visit. Leith regards the case as one of **incipient phthisis**—that is, a disease localized in one apex without physical signs.

Whitelaw [2] has been struck by the fact that **hemorrhage of the lungs** frequently occurred among his patients when "colliery warnings" were published. This led to his investigation of the barometric pressure and its relations to hemorrhages. Not only pulmonary hemorrhages, but also bleeding from other parts, seem to occur with especial frequency when the pressure is above the ordinary; 15 cases are alluded to in evidence of this view.

Lanz [3] has studied the amount of **nitrogen excreted in the sputum** in cases of pulmonary tuberculosis, in a case of pyopneumothorax, in a case of pulmonary gangrene, and one of croupous pneumonia. He finds that although the loss in a single day may be comparatively insignificant, nevertheless in the course of time in a protracted disease a very considerable amount of albumin may be lost; and it is of more significance when it is considered that the organism is already depressed as the result of the diseased process.

Moraczewski [4] reports the case of a patient suffering with pulmonary and peritoneal tuberculosis in which the urine was extremely dark-colored. There was no methemoglobin, but much indican. The urine gave off the reactions for alkapton, becoming deeply brown or dark-colored when alkalies were added. The latter color developed especially when exposed to air; it did not occur when air was excluded. **Alkaptonuria** is usually a chronic disease, but in this case it developed suddenly. The author believes its presence due to decomposition of albumin.

Barie [5] contributes an elaborate article on **pulmonary tuberculosis of the aged.** The statistics cited from the literature and his own statistics show that the disease is quite frequently developed in aged persons. Thus in the reports for 10 years of six of the large hospitals he found 2202 deaths from tuberculosis of the lung in persons above 60 years among a total number of deaths of 92,141. The mortality was therefore 2293 of the total number. Of these instances, 1604 were males and 598 females. The pathologic anatomy distinguishes itself in some particulars from that of phthisis in younger individuals. The chronic cases are in particular characterized by a tendency to bronchitis and emphysema and to fibroid change. Referring to the occurrence of tuberculosis and cancer, the author remarks that the view of

[1] Edinb. Med. Jour., Oct., 1895. [2] Brit. Med. Jour., May 30, 1896.
[3] Deut. Arch. f. klin. Med., Mar. 26, 1896. [4] Centralbl. f. innere Med., Feb. 15, 1896.
[5] Rev. de Méd., Oct. 10, 1895.

Rokitansky must be abandoned—that indeed cancer, particularly that affecting the esophagus or other parts of the gastrointestinal tract, seems to predispose to tuberculosis. The clinical features differ in some particulars from those in young persons. Cough and expectoration are especially apt to be wanting; hemoptysis, however, is not, in his experience, as rare as some writers have maintained. Digestive disturbances and diarrhea are frequent, while dyspnea and night-sweats are less pronounced. The clinical classification pursued in his detailed study is the following:

A. Chronic forms: 1. Bronchitic or catarrhal; 2. Latent, in which signs may be wanting to the end; 3. Chronic ulcerated form, in which signs are present; 4. Fibro-emphysematous form or fibroid phthisis; 5. Hemoptysic form; 6. Pleuritic.

B. Acute and subacute forms: 1. Latent; 2. Pyrexial, including (*a*) granular (miliary) tuberculosis of the pneumonic type, and (*b*) of the typhoid type; 3. Galloping consumption of the aged.

[Repeatedly in our experience in the wards of the Philadelphia Hospital we have seen cases of acute pulmonary tuberculosis in the aged, and very recently two striking cases have been under our observation. In a number of these instances the disease has been quite acute and of decidedly pneumonic type. The evidences of general toxemia have been at times very marked.]

David[1] contributes a study of the **pretuberculous polyuria** described by Robin. This form of disease is usually seen in young men of nervous temperament. It comes on abruptly with fever, weakness, and pains in the loins, and a few days later, when these symptoms subside, polyuria occurs. The thirst is increased, the appetite diminishes, and moderate fever continues. Signs of tuberculosis may appear at the same time or may not be developed until later. The polyuria gradually diminishes, and the phthisis which follows is generally chronic in its course. David believes the polyuria serves to eliminate poisons from the system, and he therefore thinks it should not be checked.

Teissier[2] records a case of **pretuberculous albuminuria,** and points out that this condition occurs in young persons as a premonitory stage of phthisis. Its origin is difficult to explain, but he believes it due to the congestive action of the tuberculous virus upon the renal structure. He cites that Bouchard has shown that tuberculin exerts a dilating influence on the blood-vessels, and Guinard and Bory have obtained transient albuminuria. He believes this pretuberculous albuminuria is due to intoxication with tuberculin before systemic infection has become marked. It is somewhat cyclic, and is characterized by the presence of albumin in pale urine of high specific gravity and very slight acidity or even neutral reaction. Casts are absent, but salts and phosphates are abundant. It resembles closely the pregouty albuminuria, but differs from the latter, mainly, in the greater persistency and more regular recurrence of albumin in the latter. General systematology would also distinguish the two cases.

[1] Rev. de la Tuberculose, Dec., 1895.

[2] Semaine méd., Jan. 8, 1896.

Diagnosis.—Hodenpyl[1] urges care in examination of sputa for tubercle bacilli, warning against conclusions regarding the presence or absence of the bacilli on the examination of poorly stained specimens. On several occasions he has injected doubtful sputa into guinea-pigs, and thus reached positive conclusions. A small quantity (2 or 3 c.cm.) of the fresh sputum is injected into the groin, and the animal killed after 15 days and examined for evidences of tuberculosis. [The paper of Maragliano, noted above, is also interesting in connection with the subject of diagnosis.]

Grasset[2] employs very dilute solutions of **tuberculin** in $\frac{1}{2}\%$ solutions of phenol **for the recognition of concealed tuberculosis.** He uses $\frac{2}{10}$ to $\frac{3}{10}$ mg. of tuberculin for the first injection, and $\frac{5}{10}$ for the second. The reaction rarely passes 1°, but he considers it characteristic, and it is invariably innocuous. He reports 13 cases in which this method enabled him to make a satisfactory differential diagnosis between tubercular and other conditions. Grasset and Wadel[3] employ minute doses of tuberculin in order to recognize incipient tuberculosis. The first injection usually consisted of from 0.2 to 0.3 mg. of tuberculin, and the second injection of 0.5 mg. No bad consequences were experienced in any of 13 cases. Weber[4] reports some experiments undertaken under the supervision of Chauveau and Strauss, with the object of determining the diagnostic value of the injections of tuberculin. Experimenting particularly upon cattle, they reached the conclusion that the reaction is ordinarily more marked in animals in the early stage; that very rarely tubercular lesions were increased in activity by the injections; and that other conditions only give the reaction when tuberculosis is also present.

Ingraham[5] doubts whether **the blood of the guinea-pig is a certain test** for the tuberculous nature of disease, urging that material containing more or less septic matter will so reduce the general vitality of the animal as to render it abnormally susceptible to tuberculous infection from any source whatever. [This view is strikingly at variance with the general experience of bacteriologists, all of whom are convinced of the value of injections into guinea-pigs as a means of establishing *a positive* diagnosis. It is to be remembered that the lesions in such experiments are mainly glandular, not pulmonary or intestinal, as would probably be the case in accidental infection.]

Treatment.—[The use of general tonics and measures which improve the surroundings of the patient undoubtedly exercise a profound effect upon tubercular processes in many cases, even in unsuitable climates. The fact that many cases recover spontaneously is significant in the same direction.] Pepper[6] reports an interesting case of tuberculosis in which the sputum at the first examination contained myriads of tubercular bacilli. Under the treatment of **strychnin and atropin with a double chlorid of gold and sodium** all signs of tuberculosis disappeared. Later, tubercle bacilli again

[1] Brooklyn Med. Jour., July, 1895.
[2] Bull. l'Acad. de Méd., Feb. 25, 1896.
[3] Rev. de la Tuberculose, April, 1896.
[4] Bull. l'Acad. de Méd., Feb. 25, 1896.
[5] Med. Rec., May 23, 1896.
[6] Univ. Med. Mag., Dec., 1895.

appeared in the sputum after a slight attack of pneumonia. On a repetition of the original treatment the patient again became apparently entirely cured.

Mays[1] is a strong advocate of the use of **strychnin** in pulmonary tuberculosis, commencing with small doses and gradually increasing until the physiologic effects are manifested. He believes that this drug, in connection with the ordinary methods of treatment, yields a larger measure of benefit in all cases of pulmonary consumption than can be derived from any other single agent.

[**Creasote** is undoubtedly a remedy of value in many cases, though it fails signally in others or may even prove harmful.] A discussion[2] upon the value of creasote in tuberculosis was held by the Société médicale des Hôpitaux. Faisans reported a case of creasote-poisoning that simulated tubercular meningitis, and concluded that massive doses of creasote might be dangerous. Burlureaux replied that as the cases of poisoning by creasote were exceedingly rare, it was advisable not only to continue to employ it, but to employ large doses.

Faisans held that, although creasote is exceedingly valuable in cases suffering from bronchial discharge, it is contraindicated by febrile nervous conditions. It does not compare with the systematic methods of treatment, and has a tendency to persuade the patient to neglect those hygienic precautions which should receive the first consideration. Fernet declared that chronic creasotism not only tended to sclerosis of the tubercular lesions of the lungs, but also to arterial sclerosis, and cited a case in which, after prolonged treatment, the patient suffered from dyspnea and paralysis of angina pectoris. He believes that creasote is particularly indicated in patients suffering from general debility. Ferrand reached the conclusion that creasote was particularly useful in cases of torpid evolution with slight or no fever, and when the lesions showed very slight traces of congestion, but was contraindicated in cases of extensive infiltration about the foci, of extreme oscillation of temperature, and in patients with the rheumatic diathesis. Hanot declared that numerous examinations had convinced him that creasote diminished the amount of urobilinuria, and that its chief value lay in its power to diminish the mixed infections. The society decided that creasote improved nutrition and that small doses were preferable, and that it was best administered hypodermically, by injections, or in suppositories. Alger[3] found improvement in 128 cases of pulmonary phthisis among 544 patients. He found that creasote was generally the most valuable drug, and in a few cases apparently produced a cure, the bacilli disappearing from the sputum. Cinnamylic acid was also employed with favorable results in the early stages. Guiter[4] declares that the most important action of creasote is to increase the activity of phagocytosis by causing a moderate reaction of an irritating nature about the bacillary foci. Hance[5] believes that there is not enough difference between the effect of large

[1] Am. Med. and Surg. Bull., May 9, 1896. [2] Rev. de la Tuberculose, April, 1896.
[3] Am. Med. Chir. Bull., Sept. 1, 1895. [4] Gaz. heb. de Méd. et Chir., Feb. 27, 1896.
[5] Med. Rec., May 2, 1896.

and small doses of creasote to justify the physician in running the danger of disturbing the digestion by the former. Guaiacol has given fairly good results used hypodermically, but is most useful for the antipyretic action that results from its epidermic application. He still believes to a certain extent in the tuberculin treatment, using it first as a test for tuberculosis in its earliest stages, and gradually increasing the dose when it is tolerated to produce an arrest of the disease-process. After the continuous use of tuberculin for nearly five years, he thinks patients thoroughly cured by the combination of tuberculin and climate have stronger resisting power against subsequent infection than those who have obtained the same results from climatic treatment alone. Chappell[1] has used creasote for tuberculosis of the upper part of the air-tract, both internally and locally. He regards the application as a reasonable precautionary measure in cases of acute tuberculosis with profuse expectoration when quantities of mucus cling to the larynx and wall of the trachea. In 10 cases of tuberculosis with acute laryngeal symptoms, 8 died within 4 months of institution of the treatment. The result in 1 case was unknown, and 1 case was apparently entirely cured, and has remained so for some time.

Coghill[2] contributes an interesting report on the use of **guaiacol** hypodermically in pulmonary tuberculosis. This method of administration was first introduced by Schetelig, who showed it was unnecessary to dilute the remedy. Coghill has used it in a number of cases, and has found that it reduces the fever, improves the general symptoms, and sometimes arrests the course of the disease. He began with doses of ℥j and increased it as much as ℥xv. It is best to inject the remedy deeply into the muscles, and the buttocks is the most favorable situation. The fever usually comes down gradually and expectoration decreases decidedly.

Breton[3] recommends the use of injections of **guaiacol and iodoform** in the treatment of pulmonary tuberculosis. The formula of his preparation is: Guaiacol, 5; iodoform, 1; sterilized olive oil, 100. The injections were made into the abdomen or flank, and the dose was gradually increased from 15 drops to three or four times that amount, and repeated every 8 or 10 days. Walters[4] has employed creasote and guaiacol subcutaneously in pulmonary phthisis. Of 4 cases, 1 was markedly improved, 1 grew slowly worse, and 2 others showed no change. He found that the treatment was well borne and that guaiacol is not inferior to creasote.

Strauss[5] reports from v. Noorden's hospital excellent results from the use of **guaiacetin** in the treatment of tuberculosis of the lungs. The remedy is a substitution-product of guaiacol, a carboxyl radical being inserted into the methyl group of the compound. He used it in 70 cases, of which 61 bore it without the slightest disturbance of the digestive organs, though some of them had previously suffered discomfort from creasote.

[A great variety of **antiseptics** have been used in the treatment of tuber-

[1] Med. Jour., May 9, 1896.
[2] Brit. Med. Jour., Mar. 7, 1896.
[3] Jour. des Prac., No. 9, 1896.
[4] Brit. Med. Jour., Dec. 14, 1895.
[5] Centralbl. f. innere Med., June 20, 1896.

culosis, and the search for a specific continues, keeping pace with the activity of the synthetic chemist.]

Breton[1] has used a mixture of **olive oil and iodoform** subcutaneously in pulmonary tuberculosis. In all, 14 patients were treated, and the results seemed to him to justify the belief that the injections were useful.

Edson[2] suggests a preparation that he names **"aseptolin,"** which is essentially a solution of pilocarpin-phenyl-hydroxid in an aqueous 2.75% solution of phenol. This fluid he has used in cases of phthisis, beginning with a dose of 50 to 70 minims daily, injected into the abdominal parietes. Usually very good results were obtained, while in malaria he has used the injections with such effect that he declares the substance to be a specific of even greater efficiency than quinine. No bad effects ever followed the injections.

Knapp[3] has employed injections of **bromin and iodin** compound in cases of pulmonary tuberculosis in 5 cases. In all, at the end of 3 weeks there was notable improvement. In 3 of the cases no reaction had occurred; in 2 the treatment had been followed by a slight rise of temperature.

McTaggert[4] employs a routine treatment for phthisis which consists of the intrapulmonary injection of **ichthyol** into active tubercular lesions and the administration, either hypodermically or by the mouth, of **guaiacol.** His report includes only 4 cases. [In connection with the methods of treatment, such as the above, that depend upon the direct injection of irritants and antiseptics, we may call attention to the plan of injecting iodin suggested and used by one of the editors many years since. In some cases beneficial results followed, but the treatment is manifestly unsuited to general application.]

Fütterer[5] advocates the use of **oil of cloves** in the treatment of tuberculosis. Gelatin capsules filled with the pure oil are administered with milk every two hours from 8 A. M. to 10 P. M. If the oil is well received, another capsule is given every hour. In addition, the oil is mixed with equal parts of cold pressed olive oil and injected subcutaneously. Necrosis of the skin has occurred in some cases, but he asserts that this has not been noted when the injections were carefully performed. They appear, however, to be painful. He has treated 243 cases in the course of $5\frac{1}{2}$ years, and all those in the first stage seem to have recovered permanently. He states that he has also had recoveries in the second stage and 2 in the third stage.

Garner and Leeson[6] have employed a combination of **potassium permanganate and salicylic acid.** They report 4 cases of their own with bacilli in the sputum, in which perfect recovery occurred.

McDowell[7] believes that a condition of **hyperpyrexia** is particularly favorable to the growth of the tubercle bacillus, and that therefore, in order to establish a condition of environment unfavorable to the organism, we should aim to reduce the temperature both generally and locally to a point at or below

[1] Therap. Gaz., May 15, 1896.
[2] Yale Med. Rec., Feb. 8, 1896.
[3] Am. Med. and Surg. Bull., Dec. 1, 1895.
[4] Therap. Gaz., Nov. 15, 1895.
[5] Jour. Am. Med. Assoc., Nov. 30, 1895.
[6] N. Y. Med. Rec., Feb. 22, 1896.
[7] Med. Jour., May 16, 1896.

37°, and to diminish cellular hypertaxis and thus remove the commonest cause of local heat. All these indications are met by the antipyretics of the aromatic group. Of these the most valuable is phenocoll. His own method is to administer 10 gr. of phenacetin whenever the temperature exceeds 37° until it reaches normal, and to repeat this treatment whenever another rise is impending. When the expectoration is profuse and purulent he has the stomach washed out every morning, and employs some safe and efficient antiseptic. After recovery the thermometer is still used several times daily for at least a year, and any tendency to fever must be checked at once. [It is very unlikely that remedies of this class will be used extensively. The depression that has occurred with even 5 grains of phenacetin in some of our cases has convinced us that the coal-tar products are generally unsafe.]

Paquin[1] gives a further report of **serum-therapy** in tuberculosis. He holds that the serum is only for the purpose of restoring to the organism the physical elasticity which the tuberculous process has destroyed. Its efficacy is most strikingly proved when used upon acute forms of tuberculosis, those which under ordinary treatment may be classed as hopeless from the very beginning. Two cases treated by this serum were completely cured, neither physical signs nor bacilli being left. He warns against certain complications that may arise in acute tuberculosis. Constant injections of serum may result in rheumatism, particularly in those with rheumatic tendencies, and it may be of benefit to suspend the injections and use lithia. Urticaria also occurs. A disturbance of the circulation, evidenced by the very pronounced flushing of the face, may occur during or just after the injection, and is associated with extreme dizziness and occasionally chills and headache; in no case was the heart ever affected. In 2 cases in which there existed a trace of albumin albuminuria increased. He declares that in local tuberculosis of the skin or glands the result of the serum-treatment is always beneficial. He[2] believes that the action of the antitubercle-serum is really to increase the number of leukocytes, and therefore the power of phagocytosis, which according to him is the curative force of microbic affections. He reports 3 cases of acute and 10 of chronic tuberculosis, and 1 interesting case of surgical tuberculosis involving various parts of the skeleton, in all of which complete cure is claimed. Further, the same author[3] admits that **antitubercle-serum** is far from perfect, as it cannot reach all of the complications of microbic character. He reports 13 cases of tuberculosis, in all of which the diagnosis was based upon careful physical examination and microscopic analysis, and in which fatal prognosis had frequently been made by other physicians. All of these cases recovered completely with the disappearance of the bacilli from the sputum. [In connection with this much-vaunted treatment we quote the experiments of Hewetson. It is unfortunate that advocates of measures of treatment of this kind rely so much upon their clinical experience and so little upon experimentation on animals.] Hewetson[4] made some careful tests with Paquin's antitubercle-

[1] Jour. Am. Med. Assoc., Oct. 19, 1895.
[2] Ibid., Apr. 18, 1896.
[3] N. Y. Med. Jour., June 6, 1896.
[4] Ibid., Nov. 9, 1895.

serum. The spleen of a tubercular guinea-pig killed 21 days after inoculation was crushed, mixed with distilled water, and filtered through cotton; 7 healthy guinea-pigs were inoculated with the filtrate; 2 of these were used as control-animals, and 5 regularly treated with Paquin's serum in doses of 6 minims every day. The average weight of the 5 test-animals at the time of inoculation was 442 gm., and 21 days later 403 gm. The average duration of life was 50.8 days. The average weight of the control-animals was 545 gm.; 21 days later, 477.5 gm. The average length of life in these two animals was 58.5 days. The lesions of the test-animals in no way differed from those observed in tubercular pigs, and the results seemed to justify one in concluding that antitubercle-serum has no influence in prolonging life of tubercular guinea-pigs. Bandiera[1] doubts that it will be possible to secure an efficient antitoxin against tuberculosis, as the toxins produced by the bacillus are harmless to it. Robison[2] employed Paquin's antitubercle-serum in a case of tuberculosis with temporary good results, although the patient subsequently failed and died. Encouraged by this, he employed it in 2 other cases, in both of which there was rapid softening and increase of all the symptoms, leading to death. He believes that these cases are such as those suggested by Paquin as suitable for the treatment, and argues that if they are not suitable, then 99 out of 100 are unsuitable, and that a treatment applicable only to such a small percentage cannot be valuable or popular.

Among those who have advocated Paquin's treatment the following may be referred to. Shropshire[3] has treated 25 patients with Paquin's antitubercle-serum, with improvement in all. Barber has used antiphthisin in 5 cases of tuberculosis. In all the diagnosis was confirmed by the presence of bacilli in the sputum. Marked improvement usually took place immediately after the treatment was begun, and continued in all cases to what was apparently complete cure. [The treatment suggested by Maragliano is closely allied to that of Paquin.] Blaise[4] reports a case of pulmonary tuberculosis treated by Maragliano's serum; 3 injections in all were given. After the first there was an unusual rise in the evening temperature, with a slight diminution in the following days, but a greater persistence of the fever in the daytime. After the second injection there was again a rise more prolonged than after the first. After the third injection, however, the temperature only reached 38°; there were dyspnea and signs of invasion of fresh pulmonary tissue. The second day after the injection there was a sudden fall of the morning temperature to 35°; 4 days later the condition of the patient became alarming: there were edema of the feet, extreme dyspnea, cyanosis, and irregularity of the pulse; 2 days later death occurred. The symptoms that occurred during the last days resembled those of uremia, although, unfortunately, the urine had not been tested for albumin. Even supposing that the serum produced the uremic complication, a single observation is not sufficient to discredit its use. Nevertheless, Blaise believes that this case gives rise to doubts of its value. He

[1] Boston M. and S. Jour., Jan. 2, 1896. [2] North Am. Practitioner, May, 1896.
[3] N. Y. Med. Jour., Jan. 4, 1896. [4] Gaz. Hebdom. de Méd. et de Chir., Jan. 19, 1896.

believes that Maragliano still owes us proof that the serum manufactured under his surveillance is never injurious to the living organism, and that it is really useful against tuberculosis. He claims that the results so far reported are explicable as an improvement due to hygiene. Carlucci[1] records 5 cases that he has treated with the antitubercular serum prepared under the direction of Maragliano. In all there was marked improvement, which to the present has been permanent. He concludes that the serum is innocuous, causes the drying up of the bronchopneumonic foci, and improves the appetite and the physical forces, and that its effect is gradual. Carlucci[2] reports 5 cases of phthisis in which Maragliano's antitubercular serum was used with good effect. The improvement was much greater than that obtained in other ways.

Trudeau and Baldwin[3] have made a careful investigation of Klebs's **"antiphthisin,"** and conclude that it resembles deutero-albumoses in its chemic reactions, and can be precipitated by sodium-bismuth-iodid. As a similar substance may be obtained from unplanted bouillon, it cannot be considered an altogether specific product of the tubercle bacillus. The "antiphthisin" furnished by Klebs is therefore practically highly diluted tuberculin, and has the same physiologic effects upon animals when given in sufficient doses. It possesses no germicidal power on the tubercle bacillus which can be demonstrated, and has no curative influence over the course of experimental tuberculosis in the guinea-pig. Dennison[4] reports some experiments of his with Klebs's antiphthisin, which he describes as an albuminous substance obtained from tuberculin. He reports 2 cases treated by this method in which the physical signs cleared up and the bacilli disappeared from the sputum. He considers that there are probably slight reactive effects, and, in opposition to Klebs, holds that the hypodermic dose should be smaller than the rectal dose. Ambler[5] records 7 cases of tuberculosis treated with Klebs's "antiphthisin," with marked improvement or apparent cure in all. No relapses have occurred in any of the cases. Von Ruck[6] reports 182 cases of pulmonary tuberculosis treated with tuberculocidin and antiphthisin. He divides the cases into 3 classes: 1. Those in which there are prospects for obtaining a good result; 2. Those in which the lung affections and complications are more serious and the general health much impaired; and 3. Cases in which the prognosis was on the whole quite unfavorable, the lung disease extensive, and septic and other complications often present. Of class 1, 81% apparently recovered, 16% were greatly improved, and 3% were improved; of class 2, 35% apparently recovered, 34% were greatly improved, 23% were improved, 4% were not improved, and 4% died; of class 3, 9% recovered, 34% were greatly improved, 14% were improved, 4% were not improved, and 38% died. In the majority of the cases reported a year has passed since their discharge without serious relapse. In only 1 case was there any

[1] Med. Rec., April 11, 1896.
[2] Ibid.
[3] Ibid., Dec. 21, 1896.
[4] Ibid., July 20, 1895.
[5] Ibid., Feb. 6, 1896.
[6] Therap. Gaz., May 15, 1896.

reason to believe that the injection had caused increase of temperature, and in all there was considerable amelioration of the subjective symptoms, such as the painfulness of the cough and difficulty in respiration. [Von Ruck's experience is certainly flattering, but does not accord with that of others. Perhaps the climate of Asheville is as powerful for good as the remedies used.]

Coghill[1] reports a case of pulmonary tuberculosis affecting both lungs, and in which, against his own judgment, he employed injections of **tuberculin.** Some improvement was noted, but the patient finally died, apparently of heart-failure due to myocarditis. The autopsy revealed extensive cavities of the lung with a dry lining membrane, surrounded by thick, fibrous walls. Dennison[2] reports a case of tuberculous cystitis with very distressing symptoms. Tuberculin was employed, with gain in weight and improvement of all the other symptoms. Two other cases of hip-disease and pulmonary tuberculosis were also improved. Of 130 or more patients that the author has treated with tuberculin, all but 1 of 33 without softening are known to be living, and 45 out of 97 with softening of the lining tissues are still living; 27 of these cases had single or double cavities.

Tuberculosis of the vascular system is unusual. But few observations of lesions within the vessels or heart have been recorded. Leyden[3] found tubercle bacilli in the vegetations of 4 cases of recent warty endocarditis, the bacilli being found chiefly in the cells.

Hanot and Levi[4] report a case in which a tubercle of recent formation was found projecting upon the interna of the aorta at a point between the origin of two intercostal arteries. The growth began in the subendothelial tissue. The patient, a man of 61, died of pulmonary tuberculosis.

Tuberculosis of the Gastrointestinal Tract.—Brocq[5] describes a case of **tuberculosis of the soft palate.** The patient was a woman suffering with tuberculosis of the larynx. The soft palate was covered by a series of small ulcerations having a punched-out appearance; there was also considerable general infiltration. The entire velum palati was involved, though the process had lasted only 2 months. This was explained by the fact that the patient was pregnant. The author recommends lactic acid in treatment.

Sawyer[6] urges the importance in cases of suspected tuberculosis of examining the **mucus collected from the rectum** just above the sphincter ani for bacilli. When found, particularly on the surface of formed stools, these clusters of bacilli are of diagnostic significance, and can be relied on to indicate tuberculous processes in the intestine. He has himself found them in several cases when they could not be found in the sputum, or when sputum could not be obtained.

Zinn[7] records a case of a man of 28 who died of miliary tuberculosis. A

[1] Lancet, Nov., 1895.
[2] N. Y. Med. Jour., Aug. 3, 1895.
[3] Berl. klin. Woch., 1896, No. 49.
[4] Compt. rend. hebdom. des Séances de la Soc. de Biol., No. 22, 1895.
[5] Jour. de Méd., Mar. 10, 1896.
[6] Med. News, May 23, 1896.
[7] Münch. med. Woch., 1895, No. 37.

mass of tubercular mesenteric glands was found, and in the intestine were found healed ulcers in the portions corresponding to the diseased glands. The case is of interest as showing **infection through the intestinal tract.**

Shattuck[1] in a clinical lecture on **tuberculous peritonitis** reports the case of a man 23 years old who had suppurative glands of the neck followed by abdominal effusion more or less sacculated; later, fluid in the pleural cavity; then recurrence of abdominal effusion; and finally necrosis of one of his ribs. Although tubercle bacilli were not found and the fluid was not injected into an animal for diagnosis, there seems little doubt that the case was one of tuberculous peritonitis. Paracentesis of the abdomen was performed at McBurney's point on account of the localization of the fluid in the right side. The author points out that although cases of this disease have recovered, mainly under surgical treatment, medical means sometimes avail, and in the present state of knowledge he would say that surgical interference is called for when medical means have failed, but not before. He refers also to another case taken acutely ill with symptoms resembling typhoid fever and also peritonitis. Effusion took place in the abdomen, and later in both pleuræ, but under medical treatment the patient slowly recovered, and Shattuck is inclined [justly we believe] to regard this as a case of possible tuberculous peritonitis.

Tuberculosis of the Pleura and Bronchial Glands.—Peron[2] discusses the pathology of tuberculosis of the pleura. He finds that the bacillary infection is at a minimum in those cases of tubercular serofibrinous pleurisies that have the clinical appearance of frank acute inflammation. He finds, moreover, that the effusion contains certain immunizing principles; thus animals which had been protected by injections of the liquid of effusions of tubercular pleurisy died later than control animals. The prognosis depends exclusively upon the extrapleural tubercular lesions that either accompany or are caused by the tubercular pleurisy. Lannelongue and Achard[3] carried on a certain number of experiments to determine the presence of mixed infection in tubercular abscesses. They found that the presence of other microorganisms was the exception in lesions not communicating with the exterior, and the rule in open lesions. In 57 cases of the former group 51 failed to give cultures upon the ordinary medium, and all but 5 of the second group gave cultures.

Rachford[4] considers that concealed tuberculosis usually means the involvement of the **bronchial glands,** and is the characteristic tuberculosis of childhood. Symptomatically it is frequently associated with tubercular family history or history of exposure to contagion, pronounced anemia without apparent cause, irregularity and early appearance of menstruation, and scanty and pale menstrual flow, dyspnea and pain in the side on slight exercise, proneness to catch cold, abnormal dwarfishness, progressive failure of health, neurotic disease, dyspepsia, and enlargement of the external lymphatics. The early

[1] Internat. Med. Mag., Oct., 1895.
[2] Revue de la Tuberculose, Apr., 1896.
[3] Ibid.
[4] N. Y. Med. Jour., Aug. 10, 1895.

diagnosis of concealed tuberculosis is especially important, because it is curable, and then affords partial immunity to pulmonary tuberculosis in later life.

Channing[1] reports an interesting case of dementia with persistent high temperature of remittent type, lasting for about two years. The only cause that could be ascertained for this febrile condition was a mass the size of a lemon which was found in the pelvis. The serious condition of the patient precluded operation, but at the autopsy this mass was found to be **tuberculosis of the ovaries and tubes.** Tuberculosis had already been suspected from the fact that the temperature was higher at night, and that there was less constitutional reaction than would be expected from any other infectious process; further, that malaria had been excluded by nonreaction to large doses of quinin. [Pelvic tuberculosis has assumed considerable importance in recent years from the discovery made by gynecologists that the tubes and uterus are frequently affected. We have ourselves seen a number of such cases, and in one or two the diseased area constituted a tumor of considerable size.]

External Tuberculosis.—Fisher[2] reports the case of a nurse who cut her finger on a broken sputum-glass used by a tuberculous patient. Tubercular swelling of the finger followed, with enlargement of the glands at the elbow and axilla. In the treatment of tuberculosis he strongly advocates the substitution of creasote carbonate for pure creasote, and reports that he has not encountered a single patient in whom an idiosynerasy against this drug was manifest. Two children, one of whom had pulmonary tuberculosis with bacilli in the sputum, and the other a child of two years suffering with tubercular enteritis with bacilli in the feces, were apparently entirely cured.

VARIOLA.

[The present year has been one of unusual importance in the history of this disease, as it marks the anniversary of Jenner's great discovery. We would refer to the splendid memorial numbers of the London Lancet and the British Medical Journal and Practitioner, but cannot here condense their contents satisfactorily.]

Etiology.—Copemann[3] discusses the etiology of smallpox and vaccinia. Inoculation with vaccinia or variolous lymph in monkeys has been very successful in reproducing these diseases. In the experiments to determine the protective power of variolous lymph, calf-lymph, and humanized lymph he found practically identical results. Specially stained specimens of clear lymph taken from the vesicles before their maturity demonstrate small bacilli, often in large numbers and in practically pure culture. These bacilli cannot be found or are very scanty in the mature lymph, on account of the spore-formation which probably has taken place at this stage. Pure cultures of a bacillus indistinguishable from that of the early vaccine lymph was obtained from the

[1] Boston M. and S. Jour., Dec. 19, 1895. [2] N. Y. Med. Jour., Aug. 17, 1895.
[3] Practitioner, Jenner Memorial Number, May, 1896.

variolous vesicles of monkeys. This bacillus could not be cultivated on ordinary media, but when inoculated upon the calf it produced vesicular eruption. Successive inoculation upon a second calf, and from this upon a child, gave practically conclusive results.

Buist [1] in a study of the bacteriology of vaccinia and variola refers to 4 different colored growths obtained from the vaccine lymph of monkeys. A bacterium of constant form is found in the clear lymph, and is probably the etiological factor in vaccination as well as in variola, but it is impossible to reproduce this bacterium by artificial cultivation. The organisms in the clear lymph he regards as spores which develop into the large forms when cultivated in solid media. These spores are distinguished from micrococci by their difference in size. The opacity of the lymph in the later stages is due to natural cultivation of the organisms.

Symptoms.—Eliot [2] has observed that there is frequently a very marked difference between the lingual and axillary reading of the temperature in cases of smallpox in the early days of the disease. He tabulates 5 cases in which this difference was pronounced, in 1 being as much as 5° F., the excess always being in favor of the lingual temperature.

Robinson [3] reports 220 cases of smallpox, in 25 of which initial rashes were present, the eruptions taking the form of erythemata and of subcutaneous hemorrhages, and were found to persist until the 6th, 7th, or 8th day. A rash having a erythematous form, but more persistent and resembling the eruption of measles or scarlet fever, occurred in 10 cases, but elevation of the eruption was never observed. The hemorrhagic form occurred in 18 cases, and took the form of numerous petechiæ confined to a comparatively small area of the skin, occurring particularly upon the lower part of the abdomen and the inner aspect of the thighs; 23, or 98%, of these 25 cases had been vaccinated, but the proportion of vaccinated to the total cases was fully 70%. A distinct relation was observed between the prodromal rash and the true eruption. The papular rash either did not develop at all on the erythematous areas or did so to a very scanty degree, and as these areas were usually expansive the cases were those of the mild type. The termination of the disease was favorable in all of the erythematous cases, and even among the hemorrhagic cases no deaths occurred.

Vagedes [4] reports a small epidemic of smallpox consisting of 15 cases. It was possible to estimate the incubation, which varied from 8 to 14 days, the usual time being 10. The prodromal stage was 2 to 4 days, and was marked by a more or less severe chill and a measles-like eruption; 4 of the cases were fatal, and all of these were unvaccinated.

Cline [5] records a curious epidemic of smallpox which occurred at the Cardiff workhouse. In many cases it was possible to fix definitely the period of incubation. In 1 this extended to 17 days. Revaccination was practised after

[1] Practitioner, Jenner Memorial Number, May, 1896.
[2] Va. Med. Monthly, March, 1896.
[3] Lancet, May 16, 1896.
[4] Deut. med. Woch., Jan. 16, 1896.
[5] Brit. Med. Jour., Apr. 4, 1896.

the first case on all that would accept it, and it was found that those who refused were far more likely to be attacked and have the disease in its most virulent form.

Diagnosis.—Nichols[1] reports a case of smallpox in which the eruption occurred shortly after the appearance of a hard chancre, which simulated in every respect the eruption of secondary syphilis. Under treatment with mercury the patient convalesced. The 2d case occurred 15 days later, and at first also simulated syphilis, but later the eruption became typically vesicular. Other cases subsequently occurred which were all characteristic of variola.

Treatment.—Sternberg[2] has found that immunity to smallpox may be induced by subcutaneous inoculation of vaccine virus without the development of a vaccine vesicle, and that it is probable that the subcutaneous injection of lymph preserved in glycerol would give protection without any septic complications; and, further, that the blood-serum of immune animals contains a substance in solution which destroys the specific virulence of vaccine virus when brought in contact with it. This substance, however, is not present in sufficient amount to make the blood-serum of the immune animals available for the production of immunity in man, although it is possible that the serum may be rendered stronger by concentration. Immunity produced by the serum is effective at once, unlike that produced by the lymph, which is not effective for 8 days.

Béclère[3] reports a case of smallpox, the patient entering the hospital on the 3d day of the eruption. She received an injection of 50 oz. ($\frac{1}{50}$ of her body weight) of serum of a vaccinated heifer under the skin of the abdomen. A rapid and perfect cure ensued, without any disturbance, local or general, in consequence of the injection; 32 days after the injection desquamation had occurred. The patient had been vaccinated but once, and that was at the age of 2. [Notwithstanding these reports and others of a similar nature (see *Year-Book*, 1896), the serum treatment of smallpox cannot yet be said to have passed its experimental stage.]

Finsen[4] believes that if cases of smallpox are kept in a room from which the chemical rays of light are absolutely excluded by deep red glass windows or red curtains from the 4th or 5th day of the disease, pustulation with its consequences, secondary fever and pitting, may be avoided. The treatment must be rigidly pursued and must be begun at the earliest moment. [The author refers to the history of this method of treatment, but this was noted in the *Year-Book* of last year.]

VACCINIA.

History.—[Nothing is more certain than the justness of accrediting the scientific use of vaccination to Jenner. It is quite likely that the practice existed before his time in various places, but the world owes to him all of the benefits derived from the general introduction of this method.]

[1] Boston M. and S. Jour., Mar. 5, 1896.
[2] Jour. Am. Med. Assoc., May 9, 1896.
[3] Jour. des Practiciens, No. 14, 1896.
[4] Brit. Med. Jour., No. 1823, p. 1413, 1895.

Morgan[1] disputes the priority of Jenner's discovery, and quotes Dhanwantari, who in the "Sacteya Grantham" described the method of inoculating with cowpox to protect from smallpox, and the symptoms which resulted from such inoculation. This book was published before or perhaps shortly after the beginning of the Christian era, but was probably not accessible to Jenner, to whom is due the credit of the rediscovery and the scientific investigation of vaccination.

Etiology.—Pfeiffer[2] confirms the observations of Guarnieri and others regarding the bodies found in the lesions produced in the cornea of animals after injection of vaccine. The bodies in question were found in the epithelium and later in the connective tissue, and are neither white nor red corpuscles, degenerations of protoplasm, nor degenerated nuclei, nor centrosomes, nor similar formations, but actual parasitic organisms, either protozoa or blastomyocetes. Von Sicherer[3] has repeated the investigations of Guarnieri and Pfeiffer on injecting vaccine into the cornea of rabbits, and has obtained similar results. Multiplication of the epithelium with parasite-like bodies in the protoplasm of the cells was obtained. The author believes these are definite parasites—*Cytoryctes Guarnieri*.

Layet[4] refuses to believe that vaccinia and variola are distinct diseases. By inoculating heifers with blood and lymph from smallpox patients eruptions were caused which he looks upon as true bovine variola. The contents of these vesicles reproduce the disease when introduced into other heifers. Later inoculation with vaccine-lymph was sometimes ineffectual, but in other cases a feeble, abortive eruption resulted.

Symptoms and Effects.—Sobotka[5] has studied 88 cases of vaccination, and especially with reference to the course of the disease and the state of metabolism. There are 4 stages, as determined by the temperature. First, a nonfebrile stage of 2 or 3 days, then one of remitting fever, lasting from the 3d to the 7th day, followed by a constant moderately high febrile movement from the 7th to the 10th day, the temperature being unaffected by the number of vesicles or the intensity of the local process. The 4th period is one of defervescence. Regarding the metabolism, he found that in 7 cases the excretion of nitrogen was increased in the 2d stage, and especially about the 10th day. Leukocytosis was found from about the 3d to the 8th day, and again from the 10th to the 12th day, and onward for several days.

Piper and Schmaase[6] made a series of investigations to determine the **frequency of albuminuria** after vaccination. The observations were made upon 122 infants, successively vaccinated for the first time, 54 children revaccinated, and 127 military recruits. The urine was examined before the vaccination and on the 1st, 3d, 7th, and 10th days. Of the 122 infants, albuminuria was found in 7, or 5.073%; in none did nephritis develop. Of

[1] Va. Med. Semi-monthly, June 12, 1896.
[2] Centralbl. f. Backt. u. Parasit., Bd. xviii. H. 25.
[3] Münch. med. Woch., No. 34, 1895.
[4] Bull. de l'Acad. de Méd., Dec. 3, 1895.
[5] Zeit. f. Heilk., Bd. xiv. p. 349.
[6] Berl. klin. Woch., No. 4, 1896.

the 54 cases of revaccination, albuminuria occurred in 10, or 16.6%, while among the military recruits it occurred in 10.063%.

Fox [1] discusses the question of vaccination. In the first group of cases he refers to abortive, rapid, tardy, or spurious evolution of the lesions; to abnormal size, recrudescence, supernumerary vesicles, and generalized eruption of the vesicles, "mulberry-sore," cheloid, dermatitis, swelling of the axillary glands, and ulceration. These are not due to immature lymph, to imperfect operation, or special conditions of the patient. In the second group he considers exanthematic eruptions; in the third, the diseases resulting from septic infection through the wound; in the fourth, the simultaneous inoculations which may occur at the time of vaccination—syphilis, leprosy, tuberculosis; in the last group the disease excited in predisposed individuals by the fact of their having been vaccinated.

Edwards [2] in studying the **statistics of vaccination** concludes that the evidence shows that vaccination in infancy and renewed at the end of childhood renders the individual safe from death, and almost as safe from infection as would an attack of variola in infancy. The early vaccination without revaccination, as is practised in England, leads to more deaths from smallpox in adults than occurred in the last century. Revaccination is therefore imperatively necessary.

Ausset [3] reports an interesting case suggesting **intrauterine transmission** of immunity from vaccinia. The patient, a man of 27, was vaccinated unsuccessfully in childhood and twice at the age of 21. He was again vaccinated at 27, and developed characteristic vesicles. He stated that his mother had had variola while carrying him. From the absence of scars it seems likely that his immunity in early life was due to transmission of the immunizing substances, and not to intrauterine variola. [While the assumption of the author may be true, the facts upon which he bases his deduction are wholly insufficient.]

ERYSIPELAS.

Etiology.—Roger [4] records 597 personal observations of erysipelas. Curiously enough, he found in a number of his cases that relatives of the patients were particularly susceptible to the disease and had had repeated attacks. The great majority of the cases occurred between the ages of 20 and 50 years. The period of incubation could be determined in 41 cases. In 5 of these cases it was less than 18 hours, in 5 more it occupied from 18 to 24 hours, the longest period being 1 case in which it occupied 22 days. In this case of erysipelas, however, Roger doubts whether the incubation was so prolonged, and suggests the possibility of a subsequent infection.

Bergen [5] reports a case of general erysipelas occurring **during the puerperium,** followed by popliteal gangrene. The disease commenced in the face,

[1] Practitioner, Jenner Memorial Number, May, 1896. [2] Ibid.
[3] Bull. de l'Acad. Méd., Jan. 21, 1896. [4] Revue de Méd., Nov. 10, 1895.
[5] Med. News, Oct. 19, 1895.

and infection could not have occurred from the genitalia, as they were healthy throughout.

Treatment.—Marmorek[1] has succeeded in producing an **antitoxin** of streptococcus infection. He has used this in cases of erysipelas with great success. The mortality before this was usually 5.12%, while during the period of its use, in which 306 cases occurred, of which 165 were considered severe enough to be injected, the mortality fell to 1.63%. Omitting certain cases with severe complications or associated conditions, the mortality was but 1.2%. A weaker serum was then employed and the mortality rose 4.82%. When the dose was sufficient, improvement in the local and general symptoms took place in 5 to 12 hours and the temperature rapidly declined, becoming normal in 24 hours. If this did not occur, the dose was repeated. Albuminuria disappeared in 24 to 48 hours after the treatment commenced when it was present before. It never occurred during the treatment. The dose varied from 10 to 20 cc., and never exceeded 120 cc. in 10 days. Similarly gratifying results were obtained in puerperal fever, and especially when this was a pure streptococcus infection.

Gonion[2] reports a case of facial erysipelas occurring in a man of 50, in which Marmorek's antistreptococcic serum was injected. The first injection was made on the 3d day after sedative remedies, inunctions of guaiacol and glycerin, and laxatives had been given. His temperature was 104.5°, and the eruption had spread since the day before. The next day the general condition was improved and his fever lessened; the 2d day still further reduction of fever and general improvement, and the second injection was given; the day following this the eruption entirely subsided and desquamation followed. Tison[3] reports the treatment of erysipelas with an antistreptococcus serum of Marmorek. Of 145 cases treated systematically by the ordinary methods, 5 died; of 409 cases treated by systematic cold baths, 16 died; of 297 cases treated by a serum of medium strength, 5 died; and of 107 cases treated by a weak serum, 7 died; of 97 cases treated by a strong serum, but 1 died—the mortality being for cases not treated by serum 3.79%, and for the serum treatment, 2.59%. These statistics show that weak serum is less effective than systematic treatment, but strong serum very much more so. After the injection the symptoms diminish markedly within a few hours, and disappear completely within a few days. Albuminuria is never caused by the injections, and if it exists it disappears. Suppuration after the injection is very rare, and the glandular swellings usually resolve favorably. Nevertheless, Tison considers that the treatment by aconitin is superior to that by the serum, as he has had 100 cases without fatal results. Bolognesi[4] points out that the statistics in this disease in particular show great variability in the severity of individual cases according as the disease occurs for the first time or has previously occurred in the same patient. The apparent effect of remedies is therefore to be governed by this knowledge. Quoting his own results, he reports 6 fatal cases among

[1] Annales de l'Inst. Pasteur, Nov. 7, 1895. [2] Lyon méd., Feb. 23, 1896.
[3] Jour. de Méd. de Paris, Apr. 26, 1896. [4] Bull. gén. de Thérap., 1896, 40e liv. p. 110.

250 cases (mortality 2.4%) in instances treated with boric vaselin; 4 deaths in 200 cases (2%) in instances treated with ichthyol ointment; 1 death in 115 cases (0.9%) treated with Renoy's method consisting, of application of ichthyol-traumaticin. These results compare very favorably with Chantemesse's statistics, showing 34 deaths in 1055 cases, or a mortality of 3.02%.

INFLUENZA.

De Renzi[1] holds that there can be no influenza without **Pfeiffer's bacillus.** He refers particularly to nervous manifestations, calling attention to the frequency of headache, especially hemicrania. This may be as severe as in meningitis. Other grave symptoms simulating those of meningitis may occur, and actual inflammation of the meninges and brain is sometimes observed. Neuroses often follow. The author advises against antipyrin and advocates quinin and salipyrin.

Hennig[2] records the experiences of an epidemic of influenza during the early months of 1895. The cases could easily be grouped in separate forms—cardiac, gastric, respiratory, and nervous. Among the latter headache, prostration, and sweating were the prominent symptoms. Headache was almost invariably present, and varied in intensity and in location. Next to this the depression or prostration, often most intense and coming and going with great suddenness, was striking. Rheumatoid pains and neuralgias were common, and alterations of the heart-rhythm, traceable to affection of the vagus, were sometimes prominent. Among the remedies used for neuralgic pains salophen seemed the most efficacious.

Ferry[3] repeats and extends his remarks upon the **throat-affections of influenza.**[4] In the mean time, communications from other physicians had convinced him that the lesions observed by himself are characteristic. In the early acute stages he finds the tongue covered with a thin white coating, but specially distinguished by dark purplish-red spots, probably enlarged fungiform papillæ. Posteriorly larger elevations are observed. Later the spots turn into pinkish-white jelly-like vesicles, but on pricking these no fluid escapes. In addition to these lesions, small whitish vesicles may occur in the mucous membrane of the lips, cheeks, palate, and pharynx. [We have found similar appearances on the mucous membrane of the throat in influenza, but identical lesions occurred in cases of other diseases; so that we cannot admit the value of this sign in diagnosis.]

Complications and Sequels.—Tecce[5] reports a case of influenza in a boy of 15, which was followed by a second attack a year and a half later, and this after a few days by headache, unconsciousness, convulsions, and coma. The lower limbs were rigid, the neck was retracted, and the abdomen depressed. The calves of the legs and the back were extremely sensitive; the temperature was never high; and the pulse was slow. After 20 days the boy recovered,

[1] La Clinica moderna, Dec., 1895.
[2] Münch. med. Woch., Sept. 3, 1895.
[3] Lancet, Oct. 12, 1895.
[4] Ibid., March 9, 1895.
[5] Riforma Med., March 20, 1896.

and has remained well. The author regards the case by exclusion as one of post-influenzal pseudomeningitis.

Goodhart[1] records a series of 9 cases of **thrombosis** of the veins of the legs occurring in the course of influenza. He regards the latter as the immediate cause. All cases ended in recovery. [This coincides to a certain extent with the experience of Robinson, referred to last year, and there seems evidence enough to believe that grippe occasionally predisposes to or directly induces thrombosis.]

Hitzig[2] describes a case of **pneumonia** following influenza and terminating in gangrene. The bacteriologic study disclosed only influenza bacilli.

Anders[3] reports 3 cases of influenza with **typhoid fever** as a complication and sequel. In all the cases the characteristic eruption appeared and the symptoms were typical. Unfortunately, no bacteriologic observations were undertaken.

Gaeser[4] reports his experience with **quinin as a prophylactic** against influenza. Only 6 men out of a squadron so treated contracted the disease.

MALARIAL FEVER.

Etiology.—Hurley[5] reports an epidemic of malaria in his own family which was traced to the water of an artesian well. The epidemic ceased when the water was carefully sterilized, and recurred when this was omitted. Newton[6] contends that malaria may be conveyed both through the air and water. He believes that in places ordinarily malarial, drinking water is probably the more frequent cause; but in places like the Campagna of Rome or the Orinoco River of South America, in which malaria is so prevalent, the atmosphere is the method of transportation. His own observations were based upon investigations made at Fort Sill, Indian Territory, when he was the post-surgeon of the United States Army. These investigations have been previously published.[7] [Undoubtedly, the evidence warrants the belief that malaria may be conveyed through the air, and by water as well. Unfortunately, no success has attended the efforts to discover the specific organisms in soil or water.]

[It has undoubtedly been proved that the malarial organism is specific for this disease, as far as it is possible to prove such a statement without obtaining pure cultures and causing the disease in man or the lower animals. There are, however, some who remain skeptical, and from time to time adverse opinions still make their appearance.] Lawrie[8] reports a case of malarial fever in which no parasites were found until after the first paroxysm. Later, they were seen daily in the blood, but bore signs of a well-marked relationship to the white blood-cells. A roset-form that was observed for a long period seemed at first like the red blood-cell with a spot of black pigment in the center. A number of small cells then made their appearance in the form

[1] Practitioner, Aug., 1895.
[2] Münch. med. Woch., No. 35, 1895.
[3] Med. News, Mar. 28, 1896.
[4] Lancet, Nov., 1895.
[5] Pacific Med. Jour., Aug., 1895.
[6] Internat. Med. Mag., Oct., 1895.
[7] Med. News, July 5, 1884.
[8] Lancet, June 20, 1896.

of a roset around the small black spot, but had no nuclei. They then gradually faded away, and nothing remained but the original cell with a black spot in the center, showing that instead of being a sporulating parasite, they were nothing more than a transition form of the extracorpuscular Laveran's body. He doubts the significance of the malarial organism.

Moser[1] describes a case of supposed pernicious malaria in which microscopic examinations of the blood discovered red corpuscles having unusual contractile power and giving rise to the most varied shapes, and simulating plasmodia. These movements occurred as much as 20 hours after the blood was drawn. The author looks upon them as degenerative changes, and believes that these, in combination with free pigment which was seen, permit the presumptive diagnosis of malaria, though the parasites were not found. Certain German authors have discovered similar formations.

Thin[2] declares that there are cases of severe malarial fever in which repeated examination may fail to find the parasite in the blood from the finger end, but in which blocks of pigment in the leukocytes testify to the destructive work of a hematozoon in the internal organs. For the examination of the tissues containing malarial parasites he prefers fixation in absolute alcohol or mercuric chlorid. He also describes a method for the detection of crescent bodies in chronic malaria. Mixing 1 drop of fresh blood with a drop of filtered saturated solution of methyl green, to which 1% of acetic acid has been added, the red corpuscles are dissolved, and only leukocytes and crescents remain visible, and the latter may easily be detected by a low power. He speaks of the importance of the examination of the blood in cases of supposed sunstroke or typhoid fever. He also describes pseudomalarial attacks occurring in patients that have returned from the tropics. These cases have occasionally a slight rise in temperature and aching pains in the bones, but the blood contains no parasites; quinin is inactive.

Ross[3] examined the blood of 112 cases of fever in India, and found the malarial parasite in one form or another in 69. In 5 cases with characteristic clinical symptoms it could not be found. He believes that the Italian classification holds good for India, and in conclusion expresses himself in favor of Manson's mosquito-hypothesis.

Morse[4] reports 26 cases of malaria, in 24 of which the organism was found. All of the cases, excepting 1 from Panama, originated in the vicinity of Boston. In the only case where the period of incubation was known it was 5 days. The case of Chagres fever from Panama exhibited a type of organism never found about Boston.

Manson[5] contributes an interesting paper on the malarial organism and the manner in which infection occurs. Studying the organisms after their removal from the body, he found that the sporules which have escaped from the broken roset-form soon become flagellated, and the same thing was true of the crescents.

[1] Med. Record, Nov. 2, 1895.
[2] Lancet. 1895.
[3] Brit. Med. Jour., Feb. 1, 1896.
[4] Boston M. and S. Jour., Jan. 16, 1896.
[5] Brit. Med. Jour., Mar. 14 et seq., 1896.

He looked upon these changes as the first phase outside the body. It is not visible in blood fixed at once after removal from the body. Reasoning from analogy of the filaria, he looked to **the mosquito** for an explanation of the manner in which the malarial organisms leave the body, and Surgeon-major Ross, who investigated the subject at his instance, found that the malarial organisms are not disturbed in the mosquito's stomach, but that spheres and flagellated bodies are formed at various intervals after the blood has been sucked from the patients. A native fed on water in which mosquitoes had laid their eggs and died, developed a fever 11 days later, and his blood contained organisms; a second experiment was negative.

Laveran [1] has examined the blood of patients suffering with fever contracted in Tonquin, Dahomey, Senegal, and Madagascar, and finds the parasite of malaria as originally described by him in 1880. In some places the organism is more virulent, as in Madagascar, and the ameboid bodies are larger than ordinary. This, however, he thinks is comparable to the difference exercised by climate upon the ordinary vegetation. He has never met with the varieties described by some authors as peculiar to tertian, quartan, and irregular types of malaria.

Symptoms.—Manson [2] discusses various forms of malarial infection. He divides the pernicious attacks into the hyperpyrexial and the algid varieties. The former is characterized by delirium passing into coma and a rapid rise of temperature. It usually occurs in intemperate people. He reports a curious case of aphasia occurring in one of these attacks, and believes that this form depends upon cerebral embolism, in hyperpyrexia to the thermic centers, in aphasia to Broca's convolution, etc. The algid forms are characterized by collapse, extreme coldness of the surface, and high rectal temperature. Choleraic symptoms may appear. Another variety of malarial attack closely simulates dysentery, with bloody stools. In these cases there is probably an accumulation of plasmodia in the vessels of the intestinal mucosa. Bilious, hemoglobinuric fever is a form which, there is reason to believe, has a parasite peculiar to itself, as it may alternate or coexist with ordinary malarial attacks. The urine is malaga-colored, and is loaded with hyaline and hemoglobin tube-casts, together with a large quantity of brownish granular matter that becomes almost solid on boiling. Ayres [3] describes a remittent fever which he believes to be malaria. As he did not look for plasmodia, it is impossible to accept his diagnosis without reserve. Homem [4] describes several cases of intense continued fever, occasionally with remissions, but usually persisting for several days, that reacted very well to quinin, and which he therefore believes to be malarial.

Walker [5] records a case of **hypertrophy of the spleen** probably due to chronic malaria. The spleen reached within 3 inches of the right anterior superior iliac spine, and there was also considerable hepatic enlargement.

[1] Sem. méd., May 9, 1896.
[2] Brit. Med. Jour., Feb. 1, 1896.
[3] Va. Med. Semi-monthly, May 8, 1896.
[4] New Orl. M. and S. Jour., Dec., 1895.
[5] Indian Med. Record, Apr. 16, 1896.

Treatment with mercurial inunctions, bone-marrow and ergot, fruit of the Carica papaya, quinin bisulph., strychnin internally, resulted in reducing the spleen almost to its normal size within 2 months of its institution. Catrin[1] urges great care in the explorations of the spleen in patients suffering from malaria. Among the evil results of too great violence, rupture of the spleen must not be forgotten. His own method is to draw the fingers upward from the left illiac fossa until the edge of the spleen can be felt, the patient lying flat upon his back.

De Brun[2] has described, under the title of **"pneumopaludism of the apices,"** a form of disease of the lungs occurring in association with malaria. It may occur as an acute or chronic disease, and especially in connection with those more chronic forms of malaria in which visceral changes are not unfrequent. Women are more frequently affected than men, and nearly all cases occur in young persons. Cough and expectoration may be present or there may be scarcely any symptoms. The cough may be slight or extremely urgent, and the expectoration is generally mucoid. The physical signs are those of consolidation at the apex; the most striking feature, however, is the absence of rales. Tubercle bacilli are absent, but malarial symptoms are always noted. The prognosis is good. Two cases of an acute form were examined postmortem, but showed no lesions. In the chronic form carnification of the lung is observed.

Hemoglobinuria and Hematuria.—Plehn[3] contributes an elaborate report on the black water fever of the West Coast of Africa. (A monographic consideration of this subject by Steudel was reviewed in last year's *Year-Book.*) He reports that 26% of all deaths among white settlers since 1890 were due to this disease, and that it constituted one-eleventh of all cases of fever. One attack increases the liability to others. He noticed a tendency of the disease to follow moderate forms of malaria, and to be ushered in with severe chills, as does Steudel in the work referred to. The general symptoms are reported by both authors as practically the same. High fever, hemoglobinuria, jaundice, prostration, nervous symptoms, and nephritis develop. Plehn has examined the blood, and finds small nonpigmented parasites which show rather slow movement and growth, gradually developing into an oval body which reaches the size of one-quarter the diameter of a red blood-corpuscle. This afterward breaks into 5 or 6 small oval bodies, staining best at one pole. The roset thus formed may remain a certain time or may break up into several parts. Crescents are sometimes found in the blood. Pigment is found in the leukocytes, rarely free, and never in the red corpuscles. Regarding the treatment, Plehn holds that quinin is of no value. [This is contrary to Steudel's observations, which seem to us, perhaps, more reliable.]

Steudel[5] repeats, in answer to Plehn, the conclusion which he arrived at and published in 1894—that the proper treatment of the black bilious fever of Africa consists in the administration of large doses of quinin. The mortal-

[1] Gaz. Hebdom. de Méd. et Chir., Jan. 23, 1869.
[2] Wien. Medizin., May and Nov., 1895.
[3] Berl. klin. Woch., 1895, Nos. 25–27.
[4] Münch. med. Woch., No. 43, 1895.

ity before the use of quinin was placed at 70%. With the use of large doses (4 to 8 gm. per day), only 3 out of 31 cases under his observation perished, and 2 of these were seriously complicated when they came under treatment. Small doses, he holds, aggravate the trouble, but large doses are specific. Quinin is also a reliable prophylactic. Boisson[1] details 3 cases of hemoglobinuric fever occurring in soldiers attacked with malaria in Madagascar and transported from there to Lyons. The onset occurred from midday to midnight, and there was an intense cold stage. Jaundice was marked, though not continuous. There were marked gastric disturbances with pain in the abdomen and vomiting, and the temperature rose to 105° or more. The reduction in the number of red corpuscles was enormous, reaching 670,000 and 1,600,000 in 2 of the cases. The red corpuscles were irregular in shape, and there were shadow corpuscles in some number. There was free pigment. Malarial organisms were found in great numbers, and it was estimated that 7 out of every 10 red cells contained parasites. The urin contained no red corpuscles, but methemoglobin, oxyhemoglobin, and urobilin. The author considers jaundice to be hematogenous in origin and due to the presence of hematin in the blood. Doering[2] refers to the treatment of black water fever, and in particular, to the value of quinin in this condition. The clinical history of 6 cases is given, all of which recovered, although they received quinin in small doses. The author regards this remedy as wholly unnecessary, having no influence on the course of the disease. He administers diuretics and forced feeding. Woldert[3] reports a case of malaria characterized by exceedingly severe hematuria. Both the intracorpuscular and the crescent types of the plasmodium were found in the blood, and they were still found in considerable numbers 10 days after quinin dissolved in nitrohydrochloric acid had been commenced.

Diagnosis.—Osler,[4] after a careful study of the malarial statistics of the various cities of the United States, states that the mortuary bills dealing with malaria are inaccurate, as a result either of the ignorance or of the wilful deception on the part of those who make the returns, and he urges that care should be taken in accepting such reports unless more specific details are given, particularly regarding the plasmodium, than have hitherto been demanded.

Boisson[5] reports a symptom of malaria that he observed in a large number of soldiers returning from Madagascar. Before the development of the chill, when the temperature is already somewhat elevated, the ordinary pale pink color of the nails gives place to a pale slaty-gray color, which is distinct from the cyanosis of asphyxia, and increases with development of the chill. He reports a number of cases in which the absence of this sign enabled him to exclude malaria, and the subsequent history of the case invariably showed that his opinion was correct. He believes that it is to be explained by the

[1] Rev. de Méd., May 10, 1896.
[2] Deut. med. Woch., No. 46, 1895.
[3] N. Y. Med. Jour., Jan. 4, 1896.
[4] Med. News, Nov. 23, 1895.
[5] Med. Rec., June 21, 1896.

alteration of a greater or less number of red corpuscles which occurs at the crisis.

Treatment.—Nanjaba [1] reports 5 cases of malaria treated by solutions of phenol. In all there was prompt recovery, in several after the ordinary antipyretic treatment had failed. George Thin [2] recommends quinin in doses of 5 gr. a day as a prophylactic against the African fever. Laborde [3] believes that the most efficacious prophylactic dose of quinin in tropical regions is about 20 cgm. a day, or from 40 to 60 cgm. every 2d day.

TYPHUS FEVER.

Legrain [4] reports a number of cases of typhus fever that occurred at the civil prison of Bougie, in which injection of serum of convalescing patients was employed. [He insists that his results establish a certain beneficial action, but the reports do not seem sufficiently satisfactory to establish this view.] Somewhat encouraging results have also been reported by Chantemesse.

CHOLERA.

Hebir [5] refers to his paper published in 1892 in which he described a hematozoon as occurring in the blood of choleraic persons. After alluding to the criticisms that had been made upon his first contribution, he states that subsequent investigations do not permit him to retract anything from his previous statements. The organism described is exceedingly polymorphous, and the following forms may be recognized: large spheres with granular or hyaline contents and surrounded by cilia; small spheres (half the size of a red blood-corpuscle) with similar contents, but fewer and coarser cilia; small ameboid bodies with spore-like bodies in their interior, and a few cilia; cyst-like bodies; and star-like organisms. [It seems rather remarkable that other observers have failed entirely to discover such organisms in the blood.]

Johnson [6] replies to Macleod, who had condemned the evacuant (castor-oil) treatment of cholera. According to Johnson, the advocates of treatment to check the preliminary diarrhea would imitate the very measures by which Koch succeeded in producing cholera in guinea-pigs. Johnson therefore speaks of the opium treatment recommended by Macleod as the "Koch guinea-pig treatment." The paper of Sir George Johnson has a pathetic interest, as it was one of the things he was engaged upon on the day of his fatal seizure.

Mitia [7] states that the experience in India has been that opium in the early diarrheal stage of cholera may check the disease, but in the later stages is harmful. This view contradicts the opinion of Johnson and the similar teaching of the Hindu treatise of medicine, the *Midan*.

Haffkine [8] proposes the term **variolization** for the process of using infectious virus taken from a patient suffering with cholera to produce immunity,

[1] Indian Med. Rec., Aug. 16, 1895.
[2] Lancet, Jan. 25, 1896.
[3] Bull. de l'Acad. de Méd., Paris, Feb. 11, 1896.
[4] Gaz. des Hôpitaux, July 4, 1895.
[5] Indian Med. Rec., July 16, 1895.
[6] Lancet, June 13, 1896.
[7] Indian Med. Rec., July 16, 1895.
[8] Brit. Med. Jour., 1895, p. 1541.

and the term vaccination for the employment of a vaccine produced by cultivating microbes and maintaining them at a fixed state of virulence. The latter method is the one employed by himself. He uses 2 injections—the first mild, and the second, after an interval of 5 days, a moderately strong one. The full effect of these is not observed until 5 days have elapsed. He has made 70,000 injections on 42,179 persons without a single mishap. The result has invariably been favorable when large numbers of persons had been exposed. Applied during an epidemic, it tends to reduce the mortality even during the first ten days. Antitoxic treatment he considers a decided success, but useless as a preventive treatment, since its effects on the system are rapidly worn out.

Behring and Ransom [1] have prepared from cultures of cholera bacilli, by separation of the bacteria themselves, a liquid having toxic power. By injection of the latter into guinea-pigs, sheep, and goats, after the methods employed in immunization, antitoxic serum was developed.

YELLOW FEVER.

Finley [2] regards the micrococcus tetragenus versatilis of Sternberg or tetracoccus versatilis as **the specific organism** of yellow fever. The organism is easily obtained in pure cultures from the serum of blisters, from the excreta, or from the milk of patients suffering with this disease. It is also obtained from mosquitoes which have fed upon patients. Pure cultures are pathogenic for animals, the symptoms in the latter occurring in two paroxysms, and death following in 5 to 9 days. Direct contagion from one rabbit to another in the same cage was observed.

Finley [3] suggests that individuals not acclimated may be rendered immune from yellow fever by inoculation with the aid of **mosquitoes.** Of 100 persons thus inoculated in the course of the last 14 years, only 3 have subsequently perished by yellow fever.

DYSENTERY.

Walsh [4] denies that it is conclusively proved that the amœba coli is the cause of tropical dysentery. He has found these amœbæ in cases that were certainly not dysenteric, and even in those in which there was no disease. In speaking of treatment, he considers emetin the valuable element of ipecac, and has given it in combination with the biniodid of mercury. Of 39 cases treated by this method, but 1 died. The average duration of the disease was 4½ days; of 10 cases treated with the bark and seeds of Holarrhena antidysenterica, all recovered, with an average duration of 5.7 days. He regards a mixture of solution of sulphate of magnesia and aromatic sulphuric acid as the best treatment. [There can be no doubt of the occasional occurrence of amœbæ in the stools of healthy persons or of individuals suffering with ordinary diarrhea, and the investigations of Cunningham have proved that the organisms in question are common in the dejecta of horses and cattle. Nevertheless, the evidence is very

[1] Deut. med. Woch., No. 29, 1895.
[2] Edinb. Med. Jour., Dec., 1895.
[3] Ibid.
[4] Indian Med. Rec., April 16, 1896.

strongly in favor of the view that the amœba coli is pathogenic in dysentery.]

Young[1] discusses the **amebic catarrhs** of the intestinal tract. He reports 3 cases, in 2 of which autopsies were held, and amebæ were found in great abundance in the distended bile ducts. In the other cases improvement occurred with discharge of greenish fecal masses which were found to be largely composed of bile and filled with amebæ. [The discovery of amebæ in the bile is certainly quite remarkable, and requires confirmation.]

Manner[2] reports a case of dysentery followed by **abscess of the liver** in which the amœba coli was found in the abscess-cavities, though none was discovered in the intestines postmortem. The patient had always lived in Vienna. He had suffered for a year with diarrhea, the stools occasionally being bloody. Amebæ were found in the stools. Evidences of an abscess of the liver developed, and the patient died soon after admission. The abscess contained numerous cavities, evidently of different periods. The oldest were encapsulated.

LEPROSY.

Kaurin[3] strongly maintains the contagiousness of lepra, and instances the increase of leprosy in islands in which it had become restricted, and in which in consequence care was not taken to maintain strict isolation.

THE PLAGUE.

Kitasato[4] reports the discovery of a bacillus in the blood, glands, and organs of patients suffering from bubonic plague. These bacilli were found encapsulated, the ends staining more deeply with aniline dyes than the middle parts, and mice inoculated with them died in 2 days, showing great edema around the point of inoculation.

Lowson[5] states that an epidemic commenced in Canton in February and reached Hong-Kong in May. The disease is a specific, infectious fever characterized by the presence of a definite bacillus, and primarily affecting the lymphatic system and afterward the cerebral and vascular systems. The chief predisposing causes are unsanitary or unhygienic surroundings. Infection takes place through the discharges from the patient, and skin-infection is impossible unless the one to be infected has some wound that is soiled by discharges or the blood. The poison is not carried by flies and mosquitoes. The period of incubation is from 3 to 6 days. The early symptoms are malaise; later the fever becomes higher, the temperature rising often as high as 106° F. Decline takes place by lysis or less frequently by crisis, and antipyretics have slight if any effect. The inguinal glands are most frequently affected, although all the glands may show more or less enlargement, and are then surrounded by a considerable amount of serosanguinolent exudation. When the mesenteric

[1] Buffalo Med. Jour., May, 1896.
[2] Wien. klin. Woch., Feb. 20, 1896.
[3] Centralbl. f. innere Med., Sept. 28, 1895.
[4] Preliminary Notes of the Bacillus of the Bubonic Plague, Hong-Kong, 1894.
[5] Epidemic of Bubonic Plague in 1894, Hong-Kong. 1895.

glands are enlarged there is frequently considerable abdominal pain. Cerebral symptoms appear early, and are usually due to meningitis or hemorrhages. Four types of brain-symptoms may be differentiated: those in which the patient is comatose, wildly delirious, apathetic, or has convulsions. Sudden heart-failure may occur, probably due to organic changes in the heart-muscle itself. In the early stage the pulse is full and bounding; in the 2d, dicrotic; in the 3d, anacrotic; and in the 4th, the pulse of collapse. There is no eruption, hematemesis is rare, and hematuria has never been noticed. In a few cases there was some conjunctival ecchymosis. The tongue is at first dry and almost covered with thin white fur, which later becomes thicker and changed to yellow-brown or black color. The buboes occasionally underwent resolution, but usually the period of enlargement was persistent, or suppuration or even sloughing occurred. The diagnosis is to be made by the discovery of the characteristic bacillus. The treatment is purely symptomatic. During this epidemic the death rate was 93.4%. Amongst Hindus it was 77%; Japanese, 60%; Eurasians, 100%; Europeans, 18.2%. The diminished mortality among the latter is probably due to the superior attention that they received. Death occurred as the result either of sudden heart-failure or as the result of hemorrhage or pyemia. During the convalescence the tissues of the body showed little reactive power, wounds healing very slowly, particularly those resulting from incisions of the buboes. Altogether, 2679 cases were treated in the hospital, of whom 2489 died.

Mahe[1] reports the principal appearances of the plague in the last 10 years. Of these 3 were in the British Empire, 2 in Persia, and 3 in China. In the last 40 years he claims that there were 150,000 deaths in China alone, and altogether about 300,000.

ANTHRAX.

Jaworski and Nencki[2] report a case of anthrax which presented the clinical manifestations of purpura hæmorrhagica, the hemorrhages having taken place mainly from the gastrointestinal tract. The patient, a young man of 36, first noticed an ulcer on the left leg which had caused considerable pain. The more violent symptoms occurred some time later, but the authors incline to believe that the primary infection took place from the gastrointestinal tract rather than from the lesion upon the leg.

Blumer and Young[3] report a case of anthrax septicemia in a man of 59, who worked in a factory in which hair brought from South America was used. He infected himself by rubbing his eye with his hand. The next day his eye was swollen, and bacteriologic examination discovered anthrax. The case ended fatally, and the bacilli were found in the organs. Acute endocarditis and peritonitis were among the lesions.

Krumbholz[4] reports a case of intestinal anthrax with choleraic symptoms.

[1] Bull. de l'Acad. de Méd., Paris, Apr. 21, 1896. [2] Münch. med. Woch., July 23, 1895.
[3] Bull. of the Johns Hopkins Hosp., 1895, Nos. 54 and 55.
[4] Ziegler's Beiträge zur Path. Anat., Bd. xvi. H. 2.

Bacilli were found in the peritoneal exudate and the blood, and microscopic examination showed that they had entered through the lymphatics.

GLANDERS.

Bares[1] reports a case of glanders in a man employed in skinning dead animals. The infection took place from a finger wound, and pustules were subsequently found in different parts of the body. The autopsy showed the characteristic lesions, and bacteriologic investigation the characteristic bacillus.

FOOT-AND-MOUTH DISEASE.

Bligh[2] records a case of foot-and-mouth disease occurring in a boy of 13. He first complained of soreness in the mouth, and the next day the mother noticed swelling of the lips and small lumps on the inside. Subsequently small blisters occurred in the mouth, and afterward vesicles appeared upon the hands. The eyelids became swollen and presented the appearance of eczematous blepharitis. There were moderate fever and other constitutional disturbances. After considering the various diseases which might present features such as those in his case, he concluded that the disease was foot-and-mouth disease, from the distribution and character of the lesions, its life-history, the associated involvement of the hand and mouth, the absence of prodromal fever, and finally from the bacteriologic study. This was conducted by the Clinical Research Association, and showed the presence of staphylococci, but particularly abundant streptococci resembling those described by Klein as pathognomonic and specific for foot-and-mouth disease among cattle.

HYDROPHOBIA.

Hayes[3] reports a case of rabies following an injury to the right hand. There were frequent and violent laryngeal spasms, particularly on any attempt to swallow. Subsequently the patient became maniacal, and had strong muscular contractions tetanic in character. True hydrophobia did not exist, the patient having the greatest desire for water, and only refusing it after a painful experience with the spasms.

Fabricius[4] reports a case of hydrophobia developing 7 months after infection. The scar became red, was tender, and surrounded by an area of inflamed tissue. Toward the end of the disease the absorptive processes must have been at a standstill, for 5 grains of morphin and $\frac{1}{2}$ grain of hyoscin produced no effect. Although the man continually ground his teeth, he never tried to bite the attendants. Another patient, who had been bitten by a dog a week before administration, but who had been drinking heavily for 3 months, was brought in, wildly maniacal, barking and making fierce efforts to bite the attendants; water produced laryngismal spasm, but milk could be readily drunk. Morphin and hyoscin acted promptly.

[1] Boston M. and S. Jour., Apr. 16, 1896.
[2] Lancet, Nov. 30, 1895.
[3] New Orl. M. and S. Jour., July, 1895.
[4] Med. Rec., Dec. 28, 1896.

SEPTICOPYEMIA.

Pane[1] reports an interesting case of streptococcæmia acutissima. A man of 53 suffered a chill, followed by high fever, then deep coma, weak pulse with cyanosis, rapid respirations, and death 44 hours after the onset. The blood taken from the finger during life showed no microorganisms, but after death dry preparations of liquid from the lungs, spleen, and bone-marrow showed microorganisms presenting the appearance of streptococci. The postmortem examination showed hyperemia and edema of the brain, enlargement of the heart, edema of the lungs, and enlargement with beginning fatty degeneration of the liver. The kidneys showed beginning brown induration, and the spleen was enlarged, of a dark-red color and soft, the cells of the pulp being degenerated. In cases of acute septicemia of this character, in the absence of abscess, erysipelas, and the like, infection through the lungs should be considered.

Port[2] reports an instance of septicemia following extraction of a tooth. The patient, a young man of 22, had suffered pain in one of the lower molar teeth for a fortnight. The tooth was extracted by a friend, shortly after which a recurrence of pain brought him to the author's attention. Irregular fever developed, and the patient finally died with the evidences of general sepsis. At the autopsy it was found an abscess had developed the size of a walnut at the angle of the lower jaw on the right side. Bacteriologic study of the pus showed the presence of streptococci and bacilli.

Bujwid[3] reports a case of general pyemia with abscesses in the muscles, secondary to specific urethritis, and in which the gonococci were found in pure cultures in the abscess. [Other instances of gonorrheal septicemia will be found in the sections on Endocarditis and Pleuritis.]

Dennig[4] contributes a study of the septic diseases and reports a number of cases. The symptomatology may be studied under the following headings: 1. General symptoms; 2. The cardiac diseases; 3. The affections of the bones and joints; 4. Conditions of the skin, subcutaneous tissues, and muscle, mucous and serous surfaces; 5. Pulmonary, gastric, intestinal, and other visceral symptoms; 6. Conditions of the central nervous system. Regarding the cardiac conditions consequent upon sepsis, he finds severe endocarditis and sometimes pericarditis. Multiple abscesses and fatty degeneration of the heart may occasionally occur, and in cases in which no macroscopic changes are apparent the dissociation or fragmentation of the muscle-fibers of Renaut may be present. Regarding the joint-conditions met with, it is of interest to note that the author places himself among those who incline to regard rheumatism as a form of mild sepsis. He calls attention to the necessity of repeated examinations of the urine, insisting upon the fact that nephritis frequently develops insidiously, and may suddenly occur without previous warning in the way of symptoms.

[1] Rivista klin. e Terap., June, 1895.
[2] Münch. med. Woch., Sept. 10, 1895.
[3] Centralbl. f. Bakt. u. Parasit., Bd. xviii. H. 14, 15.
[4] Deut. Arch. f. Klin. Med., July 18, 1895.

Etienne[1] reports 2 cases of pyosepticemia in which staphylococci were found in the blood, but in which there were no definite organic lesions, and in which the source of infection was not discovered. In both cases irregular fever, lassitude or depression, rigors, and the like were marked symptoms. Both cases recovered.

Chauffard and Ramond[2] report 2 cases of septicemia due to the micrococcus tetragenus. The first case was that of a girl of 5, in whom, after grip, a polyarthritis occurred affecting the hips, knee, thumb, shoulder, and elbow joints. There were chills, dyspnea, and an erythematous skin-eruption, and the patient died on the 11th day. The 2d case was that of a man who suffered with chills, nausea, and headache, followed by great swelling of one knee, and later by infiltration of the hip and leg on the same side and enlargement of the inguinal glands. An ulceration was found on the tongue opposite a carious tooth. The patient died on the 10th day. At the autopsy on the first case lesions of general infection were present—pericarditis and pleuritis, foci of purulent myocarditis, ulcerative endocarditis. In the second case no autopsy was made, but cultures were obtained from an ulcer of the tongue and from the infected knee.

Cameron[3] reports the case of a child born in the hospital and abandoned when a week old. At 12 days it began to have diarrhea and lost weight. During the 5th week a blue papule appeared on the abdomen, and subsequently 2 others. The ear discharged slightly and the body became blue, the limbs rigid, and the temperature ranged from 94° to 100½°. Two other cases similar to this had previously occurred, and Dr. Hammond obtained pure cultures of bacillus pyocyaneus from all the cases. In the last, however, other pyogenic organisms were found in the spleen and heart's blood, but pure cultures were obtained from one of the purple spots. Cameron sums up the symptoms of these affections as follows: marked and rapid wasting; diarrhea with gastric and enteric catarrh; moderate fever, ranging 2 to 3 degrees; albuminuria (this not yet observed in infants, but always present in rabbits); a bluish papular eruption, sometimes becoming pustular; and nervous disorders, such as spastic palsy, occurring late and attacking only the lower limbs.

Dennig,[4] in his article upon acute septic diseases, lays down the following as the most important measures of **treatment**: Absolute rest in bed must be insisted upon, especially when there is tendency to cardiac weakness, and the nutrition of the patient must be kept up by abundant food. Albuminous foods in easily assimilable forms constitute the best nutriment, and alcoholics may be useful. In case of cardiac weakness stimulants may be used. The pains are controlled by phenacetin in 0.5 gm. several times daily. Various other conditions require special treatment, and particularly must the secretion of urine be kept up to prevent uremia; for this purpose diuretin has proved useful.

[1] Arch. gén. de Méd., Oct., 1895.
[2] Arch. de Méd. exper., May, 1896.
[3] Montreal Med. Jour., Mar., 1896.
[4] Deut. Arch. f. klin. Med., July 18, 1895.

INDEFINITE INFECTIOUS DISEASES.

Hughes[1] reported upon the **endemic fever of the Mediterranean** before the Royal Medical and Chirurgical Society. It is endemic in various parts of the Mediterranean littoral, and probably elsewhere; occasionally localized epidemics occur. It was first described by Marston in 1861. Clinically, there is irregular temperature, consisting of paroxysms of fever of remittent type, separated by apyretic intervals. This gives a relapsing character to the disease. The duration is long and indefinite, the usual stay in the hospital being 90 days. Progressive anemia, constipation, swelling and effusion of the joints, profuse sweating, and tendency to neuritis are marked features. The spleen is enlarged and soft and the organs congested, but the intestines are free of ulceration. The microorganism discovered in 1886 by Bruce is said to be present constantly. The disease prevails during the dry hot months; but it is not contagious, and no connection seems to exist between its prevalence and the supply of water, milk, or food. The infection seems to enter the system with the inspired air. Its prevalence is in inverse ratio to the amount of rain, and the mortality does not exceed 2%. In the discussion Thin stated that he had made careful examinations of the blood and had failed to find malarial organisms; he further referred to a similar fever not malarial in character recently described in Hong-Kong.

Thresh[2] records a number of **epidemics of sore throat** occurring in schools, the majority of which were characterized by the appearance of a grayish false membrane about the follicles of the tonsils and by the absence of Löffler's bacillus. Other attacks simulated scarlet fever, but the course of the disease remained benign. He is inclined to think that the former type is probably a disease having distinct specific characteristics, and, as it is undoubtedly infectious, almost certainly due to some microorganism. He also describes a pseudomembranous formation that he collected from the throats of 4 patients at different periods, and which consisted almost entirely of spherical cells—apparently a form of torula. Dr. Cline, who examined cultures of this growth, regarded it as a thrush-fungus.

Palamidessi[3] records an interesting instance of an acute seizure affecting 5 members of a Florentine family. Prostration, headache, fever, delirium, and the typhoid condition were noted. The spleen was slightly enlarged, and there were rales in the back parts of the lungs. Pneumonia appeared in 3 or 4 days. Three of the patients died within 10 days after prolonged coma. Pneumonic patches were found in the lungs and slight fatty degeneration in the kidneys. The other cases recovered. Every possible cause was excluded, but it was found that a recently imported **parrot** had been received in the house and had died shortly before. This recalled the fatal epidemic of pneumonia which occurred in Florence a few months before in association with an infectious disease of imported parrots. The author obtained some parrots suffering with this disease, and made cultures which he compared with cultures

[1] Brit. Med. Jour., Apr. 18, 1896.
[2] Lancet, Aug. 17, 1895.
[3] Il Policlinico, Nov. 15, 1895.

obtained from the mouths of his patients. These studies led him to conclude that some of the microorganisms resembled fowl-cholera; they, in certain respects, resembled the bacilli obtained by Nocard from parrots dead of a specific disease, and in other respects they resembled microorganisms found in parrots by Eberth and Wolf.

SIMPLE CONTINUED FEVER.

DaCosta[1] contributes a paper upon protracted simple continued fever, and reports 2 cases. The first was a young girl with poor digestion and irritable stomach who was treated a number of years before. After a short time the digestive disturbances yielded, but an unexplainable fever arose that lasted for 3 months, never being high nor accompanied by chills or other peculiar features. Beyond the extraordinary fever there was nothing to note. Finally, after 3 months, it ended and convalescence was rapid. The 2d case was a girl of 14 who was ill with a fever for 12 weeks. The temperature was almost 105° for the first 3 weeks. Later it gradually declined and disappeared. There were no peculiar symptoms or signs of any kind excepting the fever. In neither of these cases had quinin any effect; in neither were there evidences of typhoid fever, of influenza or local diseases, and the author therefore reports them as examples of the most protracted cases of simple continued fever he has encountered. He refers to other cases of shorter duration, varying from one to a few weeks, and states that the more pronounced cases of this character occur in brokers and speculators in times of commercial panic, and that delirium is not an unusual symptom. Taking these cases as a text, the author enumerates and discusses diseases in which similar long-continued fever may take place. Typhoid fever naturally comes first, but rarely lasts as long as 3 weeks unless complications or relapses occur. The symptoms are rarely so completely absent that the fever alone would remain as the important manifestation. Remittent fevers and relapsing fevers occasion little difficulty when the blood examinations are practised. Typhomalarial fever resembles typhoid in its enteric symptoms. The continued fever that sometimes follows remittent fever may resemble simple continued fever closely. The chills and chilly sensations, disturbances of the digestive organs, and irregularity of temperature are distinguishing marks, and the malarial organisms are found in the blood. Most confusing of all are the cases of continued fever due to influenza. These may be very protracted, and may be wholly unaccompanied by other symptoms, or may be attended by involvement of the gastrointestinal tract. The author further alludes to forms of continued fever found in various localities and regarded as different from typhoid, introducing these with the remark that he still believes in the existence of a continued fever of considerable duration that is not typhoid—only a malarial fever that has become continuous—notwithstanding his full appreciation of the difficulty in distinguishing and recognizing typhoid in certain cases. He refers to the ardent fevers of the tropics of which the inflammatory fever of Copland and the thermic fever of Guitéras are varie-

[1] Am. Jour. Med. Sci., June, 1896.

ties; to asthenic simple fever of Murchison; to starvation-fever previously described by himself; to Malta fever; to continued fever previously described by Cain at Nashville; and to Cyprus fever and the simple continued fever reported by Baumgarten at St. Louis. The last two, however, are particularly questionable. Next he enumerates the various symptomatic fevers arising in connection with local diseases. Among these are miliary tuberculosis, fecal impaction, anemia (chlorosis and pernicious anemia), hysteria, chorea, rapidly advancing arteriosclerosis, disease of the endocardium or of the lung and pleuræ, or duodenal catarrh. From all of these conditions he distinguishes protracted simple continued fever. In this the lesions are absent and the spleen is not markedly enlarged. Occasionally meningeal exudation has been noted. Regarding the causation of these cases, the author inclines to the view that they are forms of autointoxication, and suggests that the poisons may be leucomains of the uric-acid group.

FOOD-INFECTIONS AND INTOXICATIONS.

Vaughan and Perkins[1] in a paper on food-infection refer to 3 cases under their observation. The first, a vigorous man of 34, ate canned salmon, and 8 hours later suffered nausea, vomiting, and griping pains. A scarlatinous rash covered the entire surface of the body. The pulse was 140, the temperature 102°. Thorough lavage of the stomach and large intestines was practised, and 10 gr. of calomel, followed by 12 ounces of solution of magnesium citrate, were administered. The bowels acted freely and the patient recovered, although the temperature remained above normal for 4 or 5 days. Chemical examination showed the absence of inorganic poisons, and bacteriologic study revealed a micrococcus, which, however, in beef-tea cultures was nonpathogenic. When cultivated after Hueppe's anaerobic method it produced a potent poison. Subcutaneous injection of liquid expressed from the salmon caused evident illness and suffering in a white rat. In the second instance the father, mother, and two children suffered with vomiting and marked exhaustion, but without fever or diarrhea, after a supper of which dried beef made a part. Anaerobic cultures from the interior of the meat developed a bacillus 2 or 3 times as long as broad, motile, not liquefying gelatin, but coagulating milk. It grew best at the temperature of the body, and developed its poison at the ordinary temperature. It was pathogenic to white rats and guinea-pigs. In the third instance a number of men at a banquet were affected. All those who ate of pressed chicken, and some persons not at the banquet, but who aided in preparing for it and ate small parts of the chicken, became ill. The attacks began 2 to 4 hours later with nausea, violent griping, and purging. Many fainted while attempting to rise from bed. The chickens had been killed Tuesday, and were not used until Thursday. Two microorganisms, a slender bacillus from four to five times as long as broad, and a streptococcus, were developed. The bacillus was fatal to white rats, guinea-pigs, and rabbits; the streptococcus was not fatal, but caused sloughing.

[1] Med. News, Nov. 16, 1895.

Brosch [1] reports a case of fatal poisoning by **oysters.** The patient suffered with vomiting, vertigo, paralysis of the muscles of the throat, the pupil, and of the face, with paralysis of the walls of the bladder and general weakness. Consciousness was preserved until the last. Postmortem there were edema of the brain and pia, and small punctate hemorrhages in the central nervous system and in the serous surfaces. Analyses of the stomach-contents showed ptomains, but these had no special characteristics. The hemorrhages noted in the case the author holds to be due to the mode of death—viz. failure of respiration. The symptoms are the same as those found in some 13 cases of fish-poisoning which have been published. Finally, he points out that poisoning by meat or fish may occur in two forms, excluding the mildest cases: In the first form true gastroenteritis with high fever and colic are the important symptoms, and the cases usually recover. These cases are due to intestinal infections with bacteria. In the second form the symptoms are those observed in the reported case, in which fever is absent and constipation caused by intestinal paralysis occurs instead of diarrhea. This form is toxic in nature, and should be treated by irrigation of the stomach and intestinal artificial feeding, frequent catheterization, and artificial respirations continued until the poison is eliminated by the kidneys. Bell [2] records a case of poisoning by canned oysters which occurred in 3 of a family of 4, the fourth not having partaken. Chatin [3] states that there are 4 varieties of toxicity which may be ascribed to oysters—that which occurs in connection with chromatism; that which occurs at the reproductive periods; that due to tissue-alterations; and that due to external conditions. Particularly in the latter case it is important to prevent the water in which the oysters grow from being contaminated, and he cites an interesting epidemic of severe cardialgia, colic with attacks of vomiting and diarrhea, and fever, which followed contamination from the presence of a garrison near the water.

Cameron [4] reports an epidemic of vomiting and purging in 74 nuns and girl pupils in a convent at Limerick. The only article to which suspicion could be attached was some custard, and this, given to pigs, induced severe diarrhea. The **eggs** from which the custard was made were stale.

GENERAL CONSIDERATIONS REGARDING THE INFECTIONS.

Fever.—At the German Congress for Internal Medicine, held April, 1896,[5] a most interesting discussion was held upon the nature and treatment of fever. Unverricht of Magdeburg, after considering the various theories of the nature of the fever, concludes that this term should be applied only as indicating the elevation of temperature: no invariable symptoms accompany the fever, and no uniform underlying cause is discoverable. In the discussion von Jaksch pointed out that, besides elevation of the temperature, alteration of the tissue-metabolism is a constant and important symptom. Kast calls attention to the fact that

[1] Wien. klin. Woch., Mar. 26, 1896.
[2] Med. Rec., Dec. 21, 1895.
[3] Bull. de l'Acad. de Méd., June 9, 1896.
[4] Dublin J. of M. Sc., Oct., 1895.
[5] Centralbl. f. innere Med., Apr. 25, 1896; Berl. klin. Woch., Apr. 20–27, 1896.

elevation of temperature may prove a conservative process, and in particular pointed out that animals inoculated with typhoid cultures and kept at a temperature of 36° died, while those in which fever was maintained at 40° and 41° recovered. Unverricht in the discussion emphasized the same points—namely, that high temperatures are not of necessity dangerous, and that, on the contrary, they may have a protective action. Jennings[1] believes that the antipyretics find their true place in the early stages of acute sthenic fevers, but are contraindicated in prolonged fevers of adynamic type. Hare[2] expresses the opinion that moderate fever not only is not harmful, but that it is a protective against infection and aids in the production of immunity. Regarding treatment, he holds that cold baths do good, not by the mere abstraction of heat, but by increasing metabolism and the rapidity of all vital processes, and that the use of antipyretic drugs is contraindicated in all infectious diseases.

Climatic Influence.—Jeannel[3] reports that the excess of deaths over births is 9 times as great in the 30 departments of France which have been deprived of their forests, as it is in the 57 others, and that these departments are particularly subject to severe and devastating epidemics of infectious diseases, such as tuberculosis, cholera, diphtheria, etc.

Treatment.—Chelmonski[4] prepared an extract of putrid meat that he employed in various infectious diseases. All of 25 cases of typhoid fever recovered, although the mortality in the hospital for the 2 years during which these cases occurred was 20 and 18%; 9 cases are reported at length, in 4 of which the temperature fell by crisis, and in 5 by lysis. All the other symptoms improved proportionately. Of 42 cases of typhus, but 1 died, although the general mortality of typhus in the hospital was 07.7%; 8 cases are reported at length, and among these was Chelmonski himself, who had sufficient confidence in his treatment to order the injections given. The general results of the injections were, first, a perturbation, then a more or less rapid decline of the temperature curve and improvement of the general condition of the patient. In certain cases the treatment did not seem to be indicated, particularly those in which there were marked symptoms of nervousness or hysteria. Smallpox, scarlet fever, and pulmonary consumption were treated by the extract without result, but a few cases of erysipelas and pneumonia were apparently benefited. He comes to the following conclusion: that the intramuscular injections are neither dangerous to life nor in any way injurious, and the injections exercise a certain influence upon many infectious diseases, shortening the duration and improving the symptoms. The extract in the form in which he uses it is not generally applicable for therapeutic purposes, first on account of the unknown factors that cause variations in its action, and second, on account of the impossibility of preserving it. Lesser[5] urges the exclusive use of water as the only nourishment in all febrile diseases during the period when the temperature is high (above 104° F.). He always com-

[1] Physician and Surgeon, May, 1896. [2] Therap. Gaz., Feb. 15, 1896.
[3] Bull. de l'Acad. de méd., Feb., 1896. [4] Deut. Arch. f. klin. Med., vol. 57 No. 2.
[5] Med. Rec., Oct. 19, 1895.

mences treatment by lavage of the stomach. He reports 17 cases treated by his method, all of whom recovered.

Theodore Beyer[1] has made some extensive experiments with **trional as a hypnotic** in various febrile diseases. Usually a deep sleep of from 5 to 6 hours' duration is produced by a dose of 1 gram. A disagreeable feeling, headache, and vertigo were sometimes very marked, but nausea and vomiting were not observed. In patients severely ill the remedy proves ineffectual.

Chantemesse[2] uses **rectal injections of the various curative serums,** and finds that they are as valuable as equal doses injected hypodermically.

Fraser[3] has made a series of experiments in order to determine how far it is possible to cause immunity to snakebite. An **antivenene** was prepared by gradually accustoming a horse to the action of the poison, and it was found that, mixed with venom in vitro and then injected, it was possible to prevent toxic action. If the injections were simultaneous, but separate, larger quantities of the antivenene were required, being smaller if the injection was made half an hour before the venom is administered and larger if made half an hour afterward. The antivenene was also effective in producing immunity when administered by the stomach, and it was found that the venom itself when so administered failed to produce any toxic symptoms, but that the animals were subsequently immune.

DIATHETIC DISEASES.

RHEUMATISM.

Etiology.—[The nature of rheumatism is still unsettled. It is included among the Diathetic Diseases in deference to custom rather than from a firm conviction that it is a chemical disorder. All of the recent investigators incline to accentuate the importance of infectious influences, and it seems well-nigh established that the disease is occasioned by specific microorganisms. The life history, nature, and manner of entrance into the system of these microorganisms require further demonstration, but the single fact of the infectiousness of the disease may be considered as practically settled. Doubtless, however, favorable conditions of the system and an inherent predisposition on the part of certain individuals are important factors. The following abstracts indicate the views entertained by various investigators.]

Humphries[4] believes that the poison of acute rheumatism is one which may manifest its presence in a number of ways, of which rheumatic fever is the severest form. The characteristics of these manifestations are a tendency to relapse, to recur, and to rapid improvement under the salicylates. He generalizes notes of 240 cases occurring in 160 patients. He first endeavors to prove that the minor manifestations, such as tonsillitis, etc., are apt to show themselves as complications of a rheumatic attack, and reports 13 cases in which this occurred; next, that all these forms have a certain period of incu-

[1] Wien. med. Bl., Aug., 1895.
[2] Jour. des Prac., 1896, No. 6, p. 93.
[3] Brit. Med. Jour., Apr. 18, 1896.
[4] Med. Press and Circular, Nov. 6, 1895.

bation, and he reports 23 cases in which a period of malaise had lasted from 7 to 21 days previous to the onset of the symptoms: 55 cases of other rheumatic affections also had prodromal symptoms. Lastly, he reports a number of cases in which the rheumatic manifestations appeared in persons thrown in contact with one another at intervals corresponding to the periods of incubation.

Chvostek [1] has investigated the etiology by making cultures from the urine removed with antiseptic precautions. He examined 12 cases, but with positive results in only 3, finding staphylococcus albus in the first, a diplococcus in the second, and a large undescribed coccus in the third. He had positive results only in cases of sepsis and gonorrhea, and concluded that the alterations of the joints are due, not to the direct action of bacteria, but to the effects of toxic substances, the latter being produced at various points. They may be caused, for example, by bacteria in the intestines, which are otherwise nonpathogenic. He does not deny the occurrence of bacteria in certain joint diseases, but questions the propriety of applying to them the term rheumatic. Regarding the seat of infection, he inclines to believe that the tonsils and intestines are the most frequent.

Singer [2] has examined the urine in 17 cases, finding staphylococcus albus in 10, s. aureus in 1, streptococci in 3, and s. albus with streptococcus in 2. The bacteria decreased and increased with the decrease or increase of the symptoms, and were so constant in occurrence that the author looks upon them as etiologically important.

An interesting discussion on rheumatism was held in the Section of Medicine of the British Medical Association,[3] which was opened by a paper read by Cheadle. The author reviewed very carefully the opinions which have been held regarding the nature and the relations of rheumatism in particular. Regarding the hereditary tendency, he found among 32 consecutive cases in private practice a definite history in 23, or 70%. If chorea and erythema be regarded as forms of rheumatism, there were 31 out of 33 cases, or 93%. If cases of arthritis, chorea, and heart disease be taken together, 180 cases gave 103 with a definite history, or 58%. If chorea (exclusive of grimacing) and heart disease are accepted as evidences of acute rheumatism, the proportion rises to 137, or 80%, with a definite family history. Double inheritance increases the tendency remarkably. After considering the different theories of etiology, he speaks at length of the infective theory, and points out the exact resemblance of rheumatism in its clinical course and complications with septic disease. The chief differences in the latter are the absence of chorea, the tendency to suppuration, the long continuance, and the lack of specific treatment. There are points which militate against the infective idea, such as the hereditary tendency, the absence of a fixed incubation period and of a definite course. These points, however, are by no means conclusive. The fact that the microorganism has not been discovered is another inconclusive point against the theory.

Of the complications, endocarditis is the most important. In 94 consecu-

[1] Wien. klin. Woch., No. xxvi., 1895.

[2] Ibid., No. xxv., 1895.

[3] Brit. Med. Jour., Jan. 11, 1896.

tive cases, 62, or 66%, gave a definite history of rheumatic fever in the patient or immediate blood relations. If chorea and heart disease are accepted as evidences of a rheumatic taint, the percentage rises to 77. He believes that the cases occurring in connection with chorea are essentially rheumatic. Endocarditis is rheumatic in a great majority of the cases, and pericarditis almost exclusively. Tonsillitis occurs so frequently in direct and immediate association that the pathological connection is undoubted. It usually precedes, in rare instances it may follow after, the rheumatism. Erythema multiforme occurred in 4 out of 8 cases which were severe. With regard to erythema nodosum the evidence is equally as strong. Rheumatic purpura is closely associated with erythema. Further, he refers to hematuria and hemoglobinuria, and states that he has seen several cases of thrombosis of the vessels.

Regarding the connection of chorea, out of 55 cases in private practice there was history of rheumatic fever in the patients or blood relations in 27, or 52%. In 2 there was a history of chorea, in 2 of erythema nodosum and chorea, and in 1 of heart disease. Including these the percentage rises to 60%. Of the 55 cases, 10 were instances of face chorea or grimacing. If these are excluded, the proportion rises to 75%. Referring to the rheumatic manifestations in scarlatina, he states that either genuine acute rheumatism occurs or the poison of scarlet fever is capable of producing similar articular inflammation and choreic manifestations.

Dyce Duckworth in discussing the paper holds that a diathetic predisposition is necessary, and that this is distinctly hereditary. He views the disease as infective, and believes salicylates are useful because of their germicidal powers. The influence of the nervous system and local conditions determine the sites of the disease. The associated fever is a favorable condition, and checks the virulence of the bacillary cause.

Archibald Garrod points out that the temperature runs an indefinite course, and is greatly influenced by the local lesions. The clinical evidence points to the infective character of the disease, and chorea is probably the result of chemical poisons produced by the bacteria, just as post-diphtheritic paralysis is the result of such poisons.

Mantle suggested the infective nature of the disease several years ago. He cites an instance in which 5 cases of scarlatina occurred in one house, and arthritis was so marked that only the eruption made the diagnosis possible. Twice he saw acute rheumatism complicated by pericarditis followed by scarlatina in other members of the family in the same house. He has seen cardiac disease follow erythema nodosum; and in 1 case, in which the latter disease occurred in a child, the mother, who nursed it, contracted rheumatic fever. He dwelt upon the epidemicity, and states that he has seen 18 cases in a small village of 300 inhabitants in the course of 3 months.

Newsholme prefers the term rheumatic fever to acute rheumatism, as the latter implies the same cause for chronic rheumatism. He strongly supports the infective theory, and refers to the Milroy Lectures delivered by himself last year. He cites the epidemic occurrence in London prior to 1868 and

1874 and in 1884, and to the very marked prevalence in Christiania in 1864, in 1870, and in 1875.

Stewart of Edinburgh, while admitting the possibility of the infective theory, holds that all must agree that there is no absolute proof. He believes that the disease might originate locally, generally secondarily, a point with which MacKenzie could not place himself in accord. The latter held, as had nearly all of the speakers, that rheumatism is a systemic disease, and joint manifestations being local expressions.

Lees held that erythema nodosum is entirely independent of rheumatism.

Bannatyne, Wohlmann, and Blaxall [1] have examined 25 cases of rheumatoid joints, and in 24 found definite microorganisms which had peculiar properties of staining and growth, and were usually present in considerable, sometimes enormous, numbers. They believe that these microorganisms enter the system from some mucous membrane in a state of chronic inflammation (particularly the tonsils), and then, becoming located in the joints, give rise to poisonous products which pass into the body generally and act especially upon the nervous system. These bacterial poisons would seem to act by a hemolytic process which is specially limited in its action to the portal blood. Dr. Blaxall, for his part, reports that the organisms are very small, and that they stain with great difficulty and may be very easily decolorized. He has found organisms in all of 18 cases of rheumatoid arthritis, but never in chronic joint diseases of other origin. He has also found the organisms in the blood of 3 out of 5 cases. The organism itself is a minute bacillus, exhibiting marked polar staining.

Gerhardt [2] at the Congress for Internal Medicine contributed a paper upon rheumatism and rheumatoid diseases. He holds that the nature of rheumatism is still an open question, no uniform infectious cause having been discovered. He classifies as impure forms of rheumatism the joint manifestations of the various acute exanthems—typhoid fever, dysentery, gonorrhea, purpura, and similar affections. In these there may be no fever or there may be considerable. The specific organisms of the infectious fevers seem to be the cause of the joint troubles, acting by metastasis. Regarding the reputed want of activity of the salicylates, he points out that this is true also of notable numbers of cases of true rheumatism. Regarding the occurrence of angina with rheumatism, he states that this was noticed in 21 % of the cases in his clinic. The angina was usually slight. He calls attention to the fact that bacteria are commonly found on the tonsils, and that the same sort are there present as have been found in the joints of rheumatism. It may be doubted, however, whether the bacteria are carried to the joints, since it is possible that toxic substances may be so conveyed and may be active.

Wade [3] considers the microbic origin of rheumatism and its connection with tonsillitis. He notes that it is a prominent circumstance that tonsillitis usually

[1] Lancet, Apr. 25, 1896.

[2] Centralbl. f. innere Med., Apr. 25, 1896; Berl. klin. Woch., Apr. 20–27, 1896.

[3] Brit. Med. Jour., Apr. 4, 1896.

precedes the rheumatic fever, while, on the other hand, occasionally the rheumatism precedes the tonsillitis. He points out that tonsillitis in its clinical manifestations corresponds with other infectious diseases, that undoubted contagion has occurred, and that various forms of microorganisms are found within the crypts while these are surrounded by aggregations of leukocytes. Further, it is striking that acute rheumatism resembles the infectious diseases and is probably infectious in its nature. Referring to cases of tonsillitis in which rheumatism has not followed or cases in which repeated attacks have occurred and rheumatism has not developed until the last, he suggests that it is likely that there is a special bacterial cause of rheumatism whose entrance into the tonsils or multiplication in the tonsils is favored by the existence of tonsillitis. The presence of this organism is necessary to development of the disease.

Williams [1] reports a case of articular rheumatism with, later, acute left-sided pneumonia, developing subsequently to extensive tatooing of the left forearm. Later chorea also developed, involving at first the left, but later both sides, and the heart was found to be affected. [The case is of interest in connection with the etiology of the disease, and would seem to indicate the possibility of external infection in some cases.]

Symptoms.—Fuchter [2] records 9 cases of rheumatism with altered cardiac or other disease in which subcutaneous nodules appeared, such as have been described by Jaccoud, and particularly by Barlow and Warner. In considering the lesions which resembled the rheumatic nodules the author notes the following: Traumatic subcutaneous nodules, in which, however, the number is limited; the epithelial nodosities of Ferreol, in which the true skin is involved and the nodules are less hard; erythema nodosum, in which, however, the size is much greater and the skin presents evidences of inflammatory change; subcutaneous gummata, in which the skin is usually adherent and evidences of inflammation or of general syphilitic infection are abundant; tophi; urticarial wheals; Heberden's nodosities; subcutaneous syphilitic nodules other than gummata, in which the history alone and the absence of signs of rheumatism would make the diagnosis of fibroid nodules, nodules of osteoarthritis, and certain benign growths such as lipoma and fibroma. The fibromata are, however, difficult to distinguish, as the rheumatic nodules are in reality fibromatous. Histologically, he found bundles of fibrous tissue and cellular elements, small round cells, fibroblasts, and polynuclear leukocytes. In the cellular process the blood-vessels were quite abundant.

Treatment.—Pearse [3] reports 14 cases of acute rheumatism treated with salophen. In 12 of these the temperature was certainly produced by the rheumatic condition, and the average duration of fever after beginning to use salophen was 5 days. The average daily dose was 1½ drachms. There were no symptoms of cardiac disturbance or renal or cerebral involvement.

Henry [4] in a note on the treatment of rheumatism with salicyl compounds

[1] Brit. Med. Jour., No. 1800, 1895.
[2] Johns Hopkins Hosp. Bull., Sept. and Oct., 1895.
[3] N. Y. Med. Jour., Mar. 14, 1896.
[4] Phila. Hosp. Rep., vol. iii., 1896, p. 45.

states that he employed them in 1877 in a large series of cases at the suggestion of his interne, Dr. C. B. Goldborough. This was the first employment of this treatment, as far as the author knows, in hospital practice in Philadelphia or perhaps even in America. The administration of salicylic acid showed a wonderful contrast to the previous results with the old alkaline treatment. H. notes the tendency to return to the use of the pure acid manifested of late, and regards this retrograde step as a wise one, the pure acid in his experience being more efficacious than any of its compounds.

Weiss[1] has studied the effect of serum injections in 10 cases of articular rheumatism. The serum was obtained from patients who had recently recovered from acute rheumatism of typical character. The author does not believe it possible to draw absolute conclusions from these cases, because, though some showed remarkable improvement after a single injection, others were injected several times without apparent effect, and salicylates had to be given in the end. In all 22 injections were given. The local disease was apparently influenced in 9 cases. As far as the general condition was concerned, 6 manifested no change.

Gonorrheal Rheumatism.—Hawkins[2] reports the case of a young man who acquired acute gonorrhea. Subsequently gonorrheal rheumatism developed; he became delirious, had high temperature, and toward the end became comatose. The antemortem temperature reached 105.6° and the pulse 170°. There were no convulsive movements, no paralysis, and no abscesses. The urine was not examined, and there was no autopsy.

DERMATOMYOSITIS.

[The relations of this condition to rheumatism remain unsettled. Undoubtedly they are allied and the evidence that dermatomyositis is infectious is quite strong. Various microorganisms have been discovered, and it is likely that infections of quite different sorts may tend to similar clinical manifestations.]

Pfeiffer[3] contributes an interesting review of polymyositis or dermatomyositis acuta. The symptomatology of the cases described under this name varies very much. The disease begins suddenly or gradually, and sometimes with general symptoms, such as headache, weakness, dizziness, and disturbances of the stomach. Moderate fever with rapid pulse and enlargement of the spleen occur, and local symptoms—edema and eruptions of the skin, inflammation and tenderness of the muscles—are characteristic conditions. Hard areas of infiltration or softening may occur in the muscles, the disease usually affecting the extremities first and then the trunk. Muscles of the eye, tongue, heart, and diaphragm are rarely involved. The most characteristic eruption is one resembling urticaria, but more persistent and having a deep red color. Subcutaneous edema may be excessive. The nervous system is not involved. The joints are unaffected and the urine free from albumin. The course is

[1] Centralbl. f. innere Med., Apr. 25, 1896. [2] Med. News, June 13, 1896.
[3] Centralbl. f. Allg. Path. und Pathol. Anat.

indefinite; complete recovery may occur after a brief or long attack, sometimes leaving atrophies with altered electrical reactions of the muscles. In severe cases death may occur from implication of the muscles of respiration and swallowing. Among the reported cases differences are noted in the character of the eruption and other symptoms. The cause is evidently some infectious principle, and Pfeiffer believes the disease to be identical with the myositis gregarinosa of the lower animals. The differential diagnosis from trichinosis is difficult, and can only be made after careful examination of parts of excised muscle and a study of the history of the case. In neuromyositis the tenderness of the nerve trunks and altered sensation make the diagnosis. The myositis of sepsis, syphilis, typhoid fever, alcohol, or overexertion is recognized by the history. The author concludes as follows: 1st. The combination of lesions of the skin and inflammation of the muscles is not sufficient upon which to base a diagnosis; 2d. The diagnosis is easy if the type as presented by Unverricht is accepted; 3d. The existence of chronic forms requires further confirmation; 4th. The cause is uncertain, but an infectious agent is most likely; 5th. Careful clinical, bacteriological, and histological studies are still necessary.

Herrick [1] contributes a most interesting review of **polymyositis acuta** and reports a case of his own. The disease, which has also been known by the names dermatomyositis and pseudotrichinosis, is characterized by inflammatory swelling of the muscles, eruptions of the skin, enlargement of the spleen, and finally inflammation of the muscles of deglutition and respiration, leading to death. Atypical and mild cases have been observed. Trichinosis, polyneuritis, and syphilis attacking the muscles must be excluded. The cause is still unknown, but microorganisms, chemical poisons (toxins), and animal parasites (gregarina) are suspected. Exclusion of trichinæ can only be made by repeated examinations of portions of excised muscle. Syphilitic myositis usually occurs late, appears without exciting cause, affects no particular muscle, and may involve more than one. It may occur as a gummous or diffuse form or as a combination of the two.

The author's case was a woman of 24, whose previous history had furnished no important indications. Subsequently it was learned that she had suffered with sore mouth and throat for a full month some ten years before, and a year later small painless swellings had appeared on the tibiæ. Her husband had been on antispecific treatment and she herself had enlarged lymphatic glands. The disease began with sharp pains in the forearm, followed by swelling and tenderness. Two days later the calf of the right leg was similarly affected, and three weeks later the other leg was involved. There was no enlargement of the spleen or liver, and examination of the blood showed moderate reduction in the number of corpuscles and in the hemoglobin, with slight increase in the polynuclear leukocytes. The temperature was moderately febrile. Incision was made into one of the muscles and portions removed. A light brownish-red fluid escaped, and some fragments of old clot. Cultures were negative. Microscopically extensive diffuse inflamma-

[1] Am. Jour. Med. Sci., Apr., 1896.

tory changes were found in the muscle. The fibers varied in size and presented a hyaline appearance. Nuclear proliferation and mitotic figures were abundant. Extravasation of leukocytes between the fibers was marked, especially about the vessels.

Zahradnicky[1] describes a case of purulent post-typhoid myositis. The abscess occurred in the muscles of the chest wall beneath the right clavicle, forming a broad flat swelling. Incision was made and 50 cc. of pus were evacuated. Cultures made from these showed the presence of the typhoid bacillus without other organisms. The author points out that post-typhoid suppuration may be due to mixed infections of typhoid bacilli and pyogenic microorganisms, to secondary infection, or to infection with the typhoid bacillus alone. His own case is of the latter description.

RHEUMATOID ARTHRITIS.

Armstrong[2] believes in the dystrophic theory of rheumatoid arthritis, and divides the joint changes into six classes, according to their cause: rheumatic, gouty, uteroovarian, phthisical and strumous, neurotic, and local. The most valuable treatment is found to be constant and alternating galvanic baths with wine of cod-liver oil. The results of this treatment are increase in strength and general improvement, with greater power of movement. Seclusion and rest are also of much service. Massage and hot baths are apt to do harm. He recommends Aix-le-bains, Buxton, and other well known baths. [It seems unnecessary to adopt elaborate classifications of causes such as the above. The essential underlying cause is still obscure, and complex classifications do not relieve the obscurity. Nervous depression undoubtedly plays a part in the genesis of this disease, and may arise in a multitude of ways.]

Fox[3] classifies rheumatoid arthritis under three heads: the arthritis of the young, the most severe and intractable form; generalized rheumatoid arthritis of the climacteric epoch, limited to females; and senile rheumatic arthritis, affecting chiefly males, this form belonging to the degenerative period and being frequently preceded by nervous depression. There is very strong evidence that some implication of the nervous system is the essential cause, and therefore the disease may be looked upon as a neurosis of which the principal manifestation is found in the joints.

Brabazon[4] analyzes 100 cases of rheumatoid arthritis. Of these 3 were typical and occurred in children between the ages of 5 and 15 years. Pigmentation spots were noted in 19 cases, and he regards them as valuable aids to diagnosis, although their absence does not exclude the disease. He describes a characteristic facies which consists of a worn and anxious expression, indicative of both mental and physical suffering, particularly in females. He considers the disease a disordered condition of the trophic nerves, producing atrophic conditions of the intraarticular structures, and involving, in a general

[1] Wien. klin. Rundschau, No. 43, 1895.
[2] Brit. Med. Jour., May 16, 1896.
[3] Internat. Med. Mag., Sept., 1895.
[4] Brit. Med. Jour., Mar. 21, 1896.

way, the muscular and other structures of the body, accompanied by a series of constitutional symptoms.

Reynolds[1] points out the distinguishing features in the deformities of the hands produced by gout and those resulting from chronic rheumatic diseases, including among the latter rheumatoid arthritis and the changes following acute rheumatism. The distinguishing point is that in gout the affection of the hands is markedly asymmetrical on the two sides, and the deformities may be quite different; while in the other conditions symmetrical involvement is the rule.

LITHEMIA.

Pathogenesis.—[The generic term lithemia may be employed to designate the systemic manifestations resulting from excess of uric acid or the allied bodies—the alloxins. The formation of these substances, and particularly their derivation from the leukocytes, has been studied with great zeal by the physiologic chemists, and practical applications of the knowledge thus acquired will doubtless soon follow. Further references are made in the sections on Diseases of the Blood, in the article on Gout, and elsewhere.]

Kossel[2] holds that the products of cellular destruction may be divided into (1) the xanthin bases (xanthin and guanin); (2) the sarcinin bases (hypoxanthin and adenin); (3) cytosin. These substances result from the destruction of nuclein and nucleinic acid. This explains the frequency of the bases named in the blood of leukemia, where they result from destruction of the leukocytes. The increased quantity of uric acid in the urine is evidence of cellular destruction. A part of the nuclein cells does not produce nuclein bases. Kossel separates this part under the name of paranuclein, and places the phosphorus-containing bodies of milk and yolks of eggs in this group.

Zuelzer[3] denies the statement of Kolisch that the conversion of xanthin bases into uric acid occurs in the kidneys and is dependent upon healthy renal functions. Unlike Kolisch, he found the ratio of uric acid to xanthin bodies little altered in nephritis, the uric acid being considerable in quantity in cases of nephritis, while the xanthin bases were not increased.

Brandenberg[4] has studied the diagnostic significance of uric acid and the xanthin bases on the urine. He finds that the alloxins increase proportionately to the total nitrogen when there is increase in the amount of food ingested, and that they decrease when nitrogenous elements are withheld, whether there be sufficient caloric units in the food or not.

In case of infection, however, when there is increased destruction of bodies containing nuclein, such as occurs in typhoid fever, the nitrogen of the alloxins reaches an abnormally high figure. In cases of carcinoma and other cachectic conditions it was found that the amount of nitrogen excreted was considerably in excess of that ingested, and he concludes that it indicates a very considerable loss of albumin from the body itself, and that whenever we find a remark-

[1] Brit. Med. Jour., Feb. 15, 1896.
[2] Berl. klin. Woch., Jan. 27, 1896.
[3] Centralbl. f. innere Med., Apr. 25, 1896.
[4] Ibid., No. 7, 1896.

ably rich excretion of the alloxin bodies in the urine, so that the relations between these and the total nitrogen are disturbed, suspicion should be aroused that the disease is one of malignant character. In those cases in which the uric acid was diminished in the urine the amount of the alloxin bodies found in the feces was lessened, and it appeared increased in those conditions, such as leukemia, in which there is an excessive excretion of uric acid.

When substances rich in nuclein, such as calves' thymus, was introduced into the alimentary tract, the amount of uric acid in the urine was always greatly increased, being, in a case of secondary anemia, almost double.

Weinstraud [1] claims that uric acid is produced in the intestinal tract in considerable quantity. This is an actual secretion, and not a mere elimination of uric acid nor a remnant from the ingested food, as the existence of uric acid in the meconium or intestinal tract after a diet free of nitrogen would indicate.

Symptoms.—Norbury [2] speaks of the importance of lithemia in the causation of various mental symptoms, such as a moody condition and explosive irritability, and other symptoms of neurasthenia. He reports 2 cases in which treatment directed to the lithemic condition completely cured these manifestations.

Rachford [3] discusses poisoning by leukomains of the uric-acid group, and recognizes four distinct types: leukomain-headache, epilepsy, gastroneuroses, and asthma. He reports a number of cases in which various forms of leukomain-poisoning occurred produced by such conditions as gout, chronic alcoholism, lead-poisoning, and uremia. In all of these cases, during the height of the attack, considerable paraxanthin was found in the urine, which produced characteristic toxic symptoms in mice.

Treatment.—Bohland [4] has investigated the action of **salicylate of soda** upon the excretion of uric acid. He finds the latter noticeably increased, and there is at the same time considerable increase of the leukocytes in the blood, so that there is therefore increased excretion of uric acid. This excretion is particularly owing to the destruction of the leukocytes, and he therefore concludes that the remedy is not to be recommended in gout, not even as a temporary analgesic.

Hills [5] reports his experiments upon uric acid in a number of cases, among others that of a patient subject to attacks of sick headache. During one of these attacks the ratio of uric acid to urea was 1 to 23. After the administration of salicylate of sodium the ratio fell from 1 to 15, but gradually increased again. Some days after the salicylate was stopped he had another attack of headache, in which the ratio was 1 to 50. In this case Hills concludes that the salicylate cleared the system of uric acid, and that the fact that headache could occur when the system was thus clear proves that the uric acid is the result and not a cause of the condition.

In a case of diabetes mellitus when there was considerable sugar the ratio

[1] Centralbl. f. innere Med., Apr. 25, 1896. [2] N. Y. Med. Jour., June 27, 1896.
[3] Med. News, May 16, 1896. [4] Centralbl. f. innere Med., Jan. 18, 1896.
[5] Boston M. and S. Jour., Mar. 19, 1896.

varied from 1 : 22 to 1 : 14. When the sugar disappeared it was practically the same, varying between 1 : 21 and 1 : 15. In the case of a man suffering from asthma in the interval the ratio was 1 : 36, during the attack 1 : 41.6.

In conclusion Hills argues that the purely chemical theory of Haig cannot be accepted as proved, and that it is very probable that the symptoms of uric-acidemia are not produced by uric acid, but rather by a perverted nutritional state, possibly of nervous origin, which results in an altered cellular metabolism.

Rachford[1] advocates the following treatment for conditions in which **leukomain-poisoning** due to paraxanthin or other bodies of the uric-acid group is supposed to be present. Potassium permanganate is administered in pill form, each pill containing 1 grain and being coated with salol : 3 of these are administered daily an hour after meals, and 1 teaspoonful of mixture in a glass of seltzer water each morning, sodium salicylate 2 drams, dry sodium phosphate 4 drams, dry sodium sulphate 10 drams. Among the cases which he records as instances of leukomain-poisoning are migraine, migrainous epilepsy, and certain gastric neuroses.

GOUT.

Etiology.—Kolisch[2] constructs **a striking theory** regarding the pathology of gout. According to this theory the essential pathology of gout consists of the increased destruction of nucleins, especially those found in the leukocytes with a production of alloxins. The latter, instead of being transformed into uric acid in the organs having this function (notably the kidneys), circulate and constitute the poison of gout. The condition of the kidneys, therefore, is of prime importance in this disease, and dietary habits, modes of life, and alcoholic or plumbic intoxication manifest themselves by their influence upon the kidneys primarily, and secondarily upon the other organs which transform the alloxins. The hereditary basis underlies the tendency to continuous excess of nucleinic reduction.

Pfeiffer[3] has carefully studied 14 cases of gout, during both the latent period and the crisis, in regard to the excretion of **urea and uric acid.** He finds that in the latent periods the average daily quantity of urine is 22.8%, higher than the normal, but the specific gravity and the acidity are reduced more than a half. The total uric acid averages 0.6 g. per day, and the total urea 19.25 g. per day, both excessively low numbers. The relation of the urea and the uric acid is as 31.8 : 1, whilst in normal individuals it varies from 35 : 1, to 40 : 1. In the majority of cases uric acid existed in the free state. During the crisis, however, it is found that not only is the daily quantity of urine not invariably diminished, but that the specific gravity is increased, and there is also a marked increase both in the amount of uric acid, which reached nearly 1 g., and the amount of urea, which reaches an average of nearly 31 g. a day, with a ratio between the two of 31.6 : 1. The majority of the cases showed the completely combined uric acid during the attack.

[1] Med. News, Dec. 7, 1895.

[2] Wien. klin. Woch., No. 45, 1895.

[3] Berl. klin. Woch., Apr. 13, 1896.

Pfeiffer undertook some experiments to test the pain-producing effect of uric acid. He found that injections of emulsions of the insoluble forms are practically painless, but that as soon as a soluble salt was employed intense pain was produced. He concluded from this, and also from the fact that a free use of alkalies frequently produces a gouty crisis, that it is not improbable that the pain of the crisis is due to increased solubility of the urates of sodium in the system, and that the conditions for the production of the crisis are therefore increased alkalinity of the juices of the body. In regard to the excretion of phosphoric acid, although in a few cases it was increased during the crisis, it is impossible to draw any definite conclusions.

Saturnine Gout.—Packard[1] contributes some interesting observations on the relation of lead-poisoning to gout. He studied some 50 workers at one of the large manufactories, and bases his observations upon the facts so obtained. Among the 50 cases there was none in which signs of tophi in the ears or eyelids were discovered, and only 1 case of articular gout. This case, a man of 40, a drinker of beer and porter, had been steadily employed for 13 years in washing the crocks used in the tan-room. The signs of gout consisted in thickening of the articular ends of the bones of the hand. These thickenings were entirely quiescent, and the patient attributed them to traumatism in handling the crocks. There was no other evidence of gout. The statistics collected by the author showed a marked predominance of gout in England as compared with America, while the cases of lead-poisoning are rather more numerous in America (Philadelphia) than in England. The author concludes: "In America, and at least in Philadelphia, plumbism is by no means rare, showing itself more commonly as wrist-drop or colic; less commonly as encephalopathies; still less as arthralgias; and with extreme rarity as gout."

Luethje[2] has investigated the subject of lead-gout and uric-acid excretion in chronic lead-poisoning. There does not seem to be any doubt of the close relationship between lead-poisoning and gout; and lead alone may cause it. Plumbism has no special effect on the excretion of uric acid, but leads to overproduction and consequent surcharge of the blood. Attacks of gout occur only after long-continued poisoning, and, as a rule, in early life. The affection spreads rapidly over many joints, and not rarely affects the hips, vertebræ, and shoulders, which are only exceptionally affected in ordinary gout.

Widal[3] reports the case of a patient suffering from chronic saturnism, with intense acute pain in the metatarsophalangeal articulation of the left foot. Later, pericardial effusion developed and the patient died. At the autopsy a huge purulent pericardiac effusion was found lying posterior to the heart, the pericardium being bound down anteriorly by adhesions. This liquid was found to contain pure cultures of pneumococci, and the same organisms were found in the swollen joints, together with an abundance of crystals of sodium urate which probably anteceded the infection and acted as a predisposing cause.

[1] Phila. Hosp. Rep., vol. iii., 1896, p. 29. [2] Zeit. f. klin. Med., Bd. 29, p. 266.
[3] Gaz. Hebdom. de Méd. et de Chir., Jan. 30, 1896.

Symptoms.—Magnus-Levy[1] reports a case of gout in which, 14 days after the commencement of the attack, there was an enormous excretion of nitrogen with improvement. The quantity of nitrogen excreted gradually diminished, and finally became very slight. In a second attack there was again a difference, but not nearly so marked. Ammonia was present in very small quantities. He refers to the average daily quantity of the various nitrogenous constituents of the urine in 9 cases, in which only 2 showed considerable increase of the alloxin bodies, and warns against positive conclusions from these results.

Treatment.—Kolisch[2] bases his views of the treatment of gout upon his theory of its pathology. Every influence which may lead to irritation or injury of the kidneys must be eliminated, and in particular alcohol and diet, which might increase the amount of irritating alloxins, must be interdicted. Among the latter are flesh rich in cellular constituents, while muscle, particularly such as has been boiled, is permissible. The carbohydrates and fats may be allowed. Milk and eggs are entirely unobjectionable, as the nucleins contained do not form alloxins. Of the vegetables, salads and greens, excepting such as asparagus, are useful. Over-exercise should be avoided on account of the tendency to increase the alloxin productions. [Kolisch's theory is attractive, but wants confirmation, and is opposed by a number of facts. The evidence in favor of the view that the final transformation of the alloxins occurs in the kidneys is scanty, and contradictory reports might be cited. Upon the whole, it seems unlikely that the renal activity is as important as Kolisch believes.]

Sir Alfred Garrod[3] in a paper on the use of **guaiacum** in gout states that 1. Guaiacum is innocuous, and may be taken indefinitely like ginger or other condiments; 2. It has power (but less than colchicum) to relieve acute attacks, being specially useful when there is little fever; 3. It is a powerful prophylactic when given between attacks; 4. Long use does not cause a loss of this prophylactic power; 5. Some persons cannot readily take the drug.

Fawcett[4] finds that piperazin is useless as a remedy for gout, as it gives no relief of pain nor increase of uric-acid excretion.

DIABETES.

Etiology.—[Nothing of great significance has been added to the knowledge of the etiology or pathogenesis of the disease. The most important contribution, that of Klemperer, is designed to establish a new element, that of renal derangement. The clinical evidence of this is entirely insufficient, as the gentlemen participating in the discussion of the paper pointed out, and the experimental evidence based upon the administration of phloridzin has not been sustained by others (Magnus-Levy) who have followed Klemperer's method. It seems improbable that the condition of the kidneys is of great importance.]

[1] Berl. klin. Woch., May 4, 1896. [2] Loc. cit.
[3] Brit. Med. Jour., May 30, 1896. [4] Guy's Hosp. Rep., London, Perry & Jacobson, 1895.

Klemperer[1] in a paper before the Berlin Society for Internal Medicine, referred to the relations of renal conditions to glycosuria. He first called attention to the fact that numerous observers, particularly among the English, had noted the disappearance of diabetes in individuals who had developed nephritis. He himself had observed such cases. It would seem, therefore, that the kidney-cells in themselves exercise some regulating function in regard to the excretion of glycogen. Further, he referred to experimental phloridzin-diabetes, which distinguishes itself from all other varieties by the fact that the blood does not contain excess of glycogen; on the contrary, it would seem that the renal irritation occasions the glycosuria, since the extirpation of the kidneys in such cases does not increase the glycogen in the blood, and the injection of the poison into one of the renal arteries causes excretion of glycogen from that kidney alone. Further, in his own experiments he found that phloridzin did not produce increase of glycogen in the blood of men despite the occurrence of glycosuria, and in 10 cases of chronic interstitial nephritis in which he administered this substance, 7 did not develop glycosuria. Phloridzin differs from other substances which produce glycosuria in another particular, the excretion of glycogen in the case of other glycosuria-producing substances being dependent upon the consumption of carbohydrates. **Renal diabetes,** in the sense in which the author understands it, is very rare, but he believes it can be recognized, and he refers to an instance affecting a man of 50 years with striking evidences of intravascular hypertension and albuminuria. He had formerly suffered with marked diabetes, but at the time had only slight glycosuria. Despite the administration of excess of various carbohydrates, the quantity of sugar in the urine remained unaltered, and the same was true of pure meat diet. In the discussion which followed upon this paper Fränkel, Gerhardt, and others held that the author's views must be taken as hypothetical and unproved for the present.

Oppler and Külz[2] discuss very fully the occurrence of **diabetes mellitus in married couples** with reference to the question whether the disease is contagious by means of the genito-urinary tract or not. They collect a number of interesting cases in literature, and finally analyze 900 cases of diabetes that had been observed in the practice of Professor Külz. Among these 900 cases were 9 married couples. In all of the cases careful investigation of the urine was repeatedly made in order that there should be no question about the diagnosis. Regarding the statistics of the condition, they collect, with their own, 4389 cases of diabetes, among which were 47 married couples. After carefully discussing the etiology of their various cases, they decide that in no case is it necessary to accept the occurrence of infection to explain the origin of the disease, and therefore it is unlikely that infection occurs.

N. S. Davis[3] in a statistical paper on diabetes mellitus calls attention to the fact that in cases under his observation during **certain months** sugar appeared in the urine with less regularity than in other months. Analyzing 55

[1] Centralbl. f. innere Med., June 13, 1896. [2] Berl. klin. Woch., June 29, 1896.
[3] Am. Jour. Med. Sci., July, 1895.

cases, he found glycosuria 3 times as often in March and in April as in June, 4 times as often in July, and a little more than 3 times as often in November. It occurred less frequently in December, January, and February, and was notably less common in May than in April or July. Stating the proportion of positive results of examination for sugar to the negative results during the same months, he finds as follows:

January	51%.	July	44%.
February	38 "	August	38 "
March	51 "	September	44 "
April	30 "	October	47 "
May	47 "	November	38 "
June	34 "	December	43 "

Lépine[1] concludes that diabetes is increasing in Paris, where alcohol acts as an important predisposing factor, but that it does not appear to act in this manner in India. He doubts the statistics that have been published regarding the distribution of diabetes.

Whitton[2] relates a family history in which the father died of diabetes at the age of 65. One son developed epilepsy, and of 3 children of his daughter, 1 had hare-lip, 1 was an epileptic, and 1 had facial paralysis. One son had a daughter with 6 fingers and 6 toes on each hand and foot. Another case developed diabetes at the age of 50. A grandson was idiotic in consequence of early closure of the cranial sutures.

[The occurrence of **glycosuria in various infectious diseases** is well known. Among others pertussis and influenza have been frequently mentioned. In most instances these cases are mild and transient; occasionally, however, severe cases are recorded.] Duke[3] reports a case of diabetes occurring in a girl 13 years of age after an attack of measles. Sugar was present at the majority of examinations, at one time amounting to 12 grains per ounce. The most effective treatment seemed to be that with codein. Bohling[4] was called to a patient who had previously suffered from nothing more than a slight attack of influenza, and was apparently in good health. He found the patient in a state of coma, from which he did not recover. The urine contained sugar and considerable acetone. There had previously been neither polyuria nor excess of appetite or thirst.

Obici[5] reviews the literature bearing on the **relation of pancreatic lesions to diabetes.** He warns against the view, sometimes entertained, that all cases of advanced diabetes are dependent upon pancreatic lesions. The relation has by no means been determined. The course of the disease in cases in which the pancreas is affected often varies. He reports 2 cases of equally rapid diabetes with equal amounts of sugar, in 1 of which the pancreas was affected, and in the other healthy. He also details 2 cases of interstitial pancreatitis and 1 of carcinoma with complete destruction of the gland, in all of which

[1] Rev. de Méd., Dec. 10, 1895.
[2] New Zealand Med. Jour., Jan. 1, 1896.
[3] Birmingh. M. Rev., Mar., 1896.
[4] Brit. Med. Jour., Feb., 1896.
[5] Boll. del. Sc. Med. di Bologna, Series 7, vol. iv.

there was no sugar in the urine. In the first of the cases the interstitial pancreatitis was of vascular and lymphatic origin, representing the changes which Lépine regards as particularly favorable to the development of glycosuria.

Triboulet[1] urges that certain forms of diabetes are unquestionably associated with alterations of the liver. Particularly is this true of alcoholic diabetes associated with hepatic cirrhosis.

Symptoms.—Thayer[2] reports several cases of diabetes which were remarkable for the small quantity of urine passed. One is said to have passed 9 oz. of urine and 3¼ oz. of sugar in 24 hours; in another 7 oz. of urine and 2½ oz. of sugar. In the others the proportions were about the same. He claims to have cured a patient by an exclusive meat and salad diet. [We have repeatedly met with cases in which the quantity of urine was small and the amount of sugar excessive. The figures in the above report, however, are remarkable.]

James[3] has examined the blood in 2 cases of diabetes. He finds that when fasting from both food and drink there was a condition of anhydremia, the corpuscles being considerably above 6,000,000 and the hemoglobin 100%. After drinking copiously of water the number of corpuscles, the amount of hemoglobin, and the specific gravity of the blood decreased.

Complications.—Bussenius[4] reports, from Senator's clinic, a case of **lobar pneumonia** occurring in a patient who had diabetes. The sugar did not disappear from the urine, but was present in large quantities, despite the fact that only small amounts of carbohydrate food were given by the mouth. With the beginning of the fatal termination the amount increased rapidly, but later it diminished so that hardly a trace was found just before death: 0.25% of sugar was present in the patient's sputum. Among 700 cases of diabetes seen by Senator, there were 7 instances of pleuropneumonia with 4 deaths. In these cases the sugar never disappeared entirely, though in 1 there was notable decrease.

Koenig[5] reports 2 cases of **gangrene** occurring in diabetes in which, after failure of dietetic treatment, amputation was practised, with prompt recovery from the operation and subsequent disappearance of sugar from the urine.

Nonne[6] reports the case of a woman aged 64 who had moderate diabetes, and 4 years later gradually developed progressive **muscular atrophy,** beginning in the upper limb, extending to the lower, and being accompanied by reactions of degeneration. She died of bronchopneumonia. Microscopic examination of the cord showed chronic degeneration of the cells and fibers in the anterior horns from the cervical to the lumbar regions. The author believes this to be the first case in which typical signs or progressive muscular atrophy have been found during life in diabetes, and in which the lesions were found postmortem.

Pigmentary Diabetes.—Marie[7] records a case of *diabète bronzé,* and

[1] Gaz. Hebdom. de Méd. et de Chir., Apr. 19, 1896.
[2] Med. Rec., Aug. 17, 1895.
[3] Edin. Med.Joul., Apr., 1896.
[4] Berl. klin. Woch., Apr. 6, 1896.
[5] Ibid., June 22, 1896.
[6] Ibid., Mar. 9, 1896.
[7] Semaine méd., 1895, p. 229.

summarizes the literature of this interesting affection. He asserts that in 11 cases he found recorded all presented much the same symptoms. It occurs in adult life, and especially in men, and alcohol is the important cause. Dryness of the mouth, excessive thirst, polyuria, and diarrhea are early symptoms. The amount of sugar in the urine varies in different cases and at different times, but is usually small and diminishes toward the end of the disease. Tympany, slight ascites, enlargement and tenderness of the liver, enlargement of the spleen, and distention of the abdominal veins are the ordinary abdominal symptoms. Sometimes there is lymphangitis of the skin of the abdomen. The skin is mildly jaundiced and the urine dark, but probably not from bile. Rapid emaciation and edema of the lower extremities supervene. The pigmentation of the skin involves the whole body, though it is darker on the exposed parts and about the genitalia. The mucous membranes are unaffected. The color of the skin varies from a brown to a grayish black. The disease is rapid, and death usually occurs within a year, preceded by increased edema, and sometimes by high fever or a purpuric eruption. The sugar may disappear entirely from the urine.

Marie's patient was a man of 51, who began to drink heavily at 40, and had severe bronchitis. Six years later an abscess formed on the arm and discharged offensive pus; 4 years later he had grip, followed by edema of the legs and gradually increasing evidences of pigmentary hepatic cirrhosis with glycosuria. He finally died of tuberculosis of the lungs. Postmortem the liver was found dark, enlarged, and cirrhotic, and there was more or less sclerosis with pigmentation of the pancreas and the heart as well. This pigment of the liver and other organs was iron-containing, and responded to the reaction with ammonium sulphid. The pigment is derived from the hemoglobin, which is liberated under the influence of some primitive cause, and then transformed in the cellular protoplasm of the organs. Marie insists that this is a specific disease, having some resemblance to pancreatic diabetes, and not a variety either of hypertrophic cirrhosis with pigmentation nor of ordinary diabetes.

Hanot,[1] referring to the form of diabetes accompanied by hepatic cirrhosis and pigmentation of the skin, first described by himself in collaboration with Chauffard in 1882 and afterward (1886) called *diabète bronzé* by himself, holds with Marie that this is an independent disease or entity. The hepatic cirrhosis is a vascular and generally hypertrophic condition, the liver in different cases weighing from 1800 to 3500 g. The important symptoms are those of diabetes, with abundant glycosuria, melanodermia, most marked upon face, limbs, and genitals, general symptoms of hypertrophic cirrhosis, with enlargement of the liver and spleen, slight ascites, and distention of the abdominal cutaneous veins. The author refers to 2 cases recently under his observation.

Diagnosis.—Bremer[2] has contrived a reagent which consists of a mixture of a saturated watery solution of eosin and methylen blue, from which the precipitate is filtered, dried, and reduced to a fine powder. To this is

[1] Brit. Med. Jour., Jan. 25, 1896. [2] N. Y. Med. Jour., Mar. 7, 1896.

added small quantities of eosin and methylene-blue. If now diabetic blood be fixed upon cover-glasses by means of heated alcohol and ether and stained with this reagent, the erythrocytes acquire a deep green color which is totally different from the color of normal erythrocytes. This color, he holds, is due to some foreign body in the corpuscles, which is certainly not glucose, and is not dependent upon the amount of sugar which appears in the urine. It occurs in all forms of diabetes and glycosuria, excepting those produced by phloridzin. From a single case in which it did not occur Bremer believes that it is not characteristic of glycosuria, which is essentially renal. It is therefore of value in differentiating hematogenous glycosuria from renal diabetes. [We cannot agree with the author's views, as we have occasionally found the same green color in staining the blood of various diseases with eosin and methyl-blue. Sometimes the results obtained have been exactly those described by Bremer. We must therefore regard the test as valueless.]

Treatment.—Robin[1] employs a form of **"alternating treatment"** in diabetes. He believes that the increased chemical changes, and those of the liver particularly, result from stimulation of the nervous system, and therefore recommends drugs which act upon this system primarily. For 4 days he administers 15 gr. of antipyrin and 8 gr. of sodium bicarbonate twice daily, while cod-liver oil is taken twice a day and Seignette salt as a purgative in the morning. At the end of 4 days he gives 6 gr. of quinin after the midday meal, continuing this for 6 days, then discontinuing 4 days, and again administering for 6. Before the morning and evening meals a capsule containing arseniate of sodium, carbonate of lithium, and codein are recommended. Next he gives a pill of opium, belladonna, and valerian for 10 days, and the patient is allowed to drink a weak solution of bicarbonate of soda (1 : 125). In nervous women or when there is intolerance of the opium and belladonna potassium bromid may be substituted. Further, he recommends the food to be well salted, and advises the green vegetables and also a weak solution of potassium tartrate to supply the needed potash, with glycerophosphate of lime and magnesium to supply the phosphates. He has used this "alternating method" in 100 cases, in each of which the daily amount of sugar excreted was 100 g. or more. In 24 of these recovery occurred, in 25 recovery is still doubtful, in 33 there was improvement, and in 18 the results were negative.

Cassaet[2] advocates the use of **brewer's yeast** in all forms of diabetes. He administers 50 grams daily. The immediate effect is an expulsion of gas by eruption, and after the first or second day fetid diarrhea with abundant gas. Then tolerance is established and the treatment may be continued. Three cases under his observation showed unmistakable improvement, gaining weight and becoming free of some of the symptoms.

Chittick[3] has used **codein and iodol** with very excellent results in diabetes. He believes that the codein is more efficient, but that the other drug may replace it almost completely. He reports 4 cases, in 3 of which a perfect cure,

[1] Bull. de l'Acad. de Méd., No. 23, 1895. [2] Semaine méd., Aug. 21, 1895.
[3] Physician and Surgeon, Oct., 1895.

apparently, took place. In the fourth there was much improvement. The treatment should invariably be associated with an antidiabetic diet.

West[1] recommends **uranium nitrate** in the treatment of diabetes mellitus. Leconte stated in 1851 that the prolonged use of this remedy will cause glycosuria, and a homeopathic physician first used it in the treatment of the disease, claiming excellent results. West used it in the routine treatment of a number of cases, and met with a great deal of encouragement. He "found, after the drug had been administered a short time only, that all of the patients without exception stated that their thirst was greatly relieved, and the frequency of micturition and the quantity of urine passed greatly reduced." The quantity of sugar usually decreased, and in one case glycosuria ceased entirely. Three cases are reported with some detail, but others gave just as satisfactory results. Regarding the manner of action, he assumes, from the failure of Mr. Symonds to find any uranium in the urine, that the drug is not absorbed and acts within the digestive tract, probably in the way of preventing the rapid digestion of starches and of some of the forms of albumin. He suggests that it may be specially useful in preventing excessive pancreatic digestion. The nitrate is the most useful salt, and should be given, freely diluted with water, after food. A beginning dose of 1 or 2 gr. may be administered twice daily at first; subsequently the dose may be increased. Morrison[2] reports 3 cases of diabetes treated with the same remedy. All were improved, but none permanently.

Gans[3] has determined experimentally that solutions of **common salt** retard the conversion of glycogen into sugar, and suggests that the same action may possibly occur when salt is administered in diabetes.

Ringer[4] precipitates a curd from milk with acetic acid, separates it from the clear fluid, and then rubs it up with calcium carbonate and water until it is completely dissolved. This may be used in place of milk by diabetic patients.

Jones[5] considers that the most hopeful treatment of diabetes is likely to be found in **pancreatic medication,** particularly since true diabetes mellitus is due, in a large percentage of the cases, to degenerative or destructive lesions of the pancreas. As administration by the stomach has been uniformly unsuccessful, he suggests 1 of the 3 following methods as being possibly successful: Rectal injection, subcutaneous injection, or pancreatic grafting. [Notwithstanding the author's hopefulness, it is doubtful if pancreatic medication, however carried out, will prove as useful as he thinks. The percentage of cases in which pancreatic lesions or functional disturbances play a part is still uncertain.]

OSTEOMALACIA.

Allison[6] reports a case of osteomalacia, coming on about the age of puberty, and at the time of observation 43 years old. The patient suffered from extreme deformity of the whole skeleton and severe pains in the affected bones.

The treatment consisted in the administration of a glycerol extract of

[1] Brit. Med. Jour., Aug. 24, 1895.
[2] Ibid.
[3] Centralbl. f. innere Med., Apr. 25, 1896.
[4] Brit. Med. Jour., No. 1823, 1895.
[5] Med. Rec., May 23, 1896.
[6] Edinb. Med. Jour., May, 1896.

healthy marrow, about 4 ounces being given weekly. Improvement was felt on taking the second dose; the pains began gradually to pass away and the patient brightened considerably. Deformity also commenced markedly and progressively to disappear, the most striking improvement being shown in the limbs. A peculiar feature was the spontaneous reduction of existing dislocations. The muscles also developed rapidly, but this was possibly due to massage, which was being carried on at the time, and the patient gained so much power that she was able to support herself. At the end he reports continued improvement in the present case, and some benefit in a case of general bone-weakness and deficiency, due to premature birth; in a case of angular curvature of the spine, due to rickets; and in a case of old-standing, non-suppurative, curvature of the spine.

OBESITY.

Treatment.—Schlesinger[1] reports a case of obesity with improvement from the use of **thyroid tablets.** When the thyroid of the ox was substituted for that of the sheep the patient began to grow fat. This he explains by the fact that the ox thyroid does not contain thyroidin.

Bourneville[2] has investigated the effect of thyroid gland on growth and obesity. In 3 myxedematous idiots the striking points were loss of weight and increase of growth, indicated by enlargement of the waist-measure. It was then tried in 3 cases of obesity in idiots, and their growth was found proportionately more in 4, 5, or 6 months than the average growth of 18 untreated imbeciles and epileptics. The growth was still more striking when compared with the lack of growth before the treatment. As regards obesity, he found that 2 of the idiots lost weight rapidly during treatment, and the third gained during the treatment, but lost rapidly afterward. Generally, the rule was rapid loss during treatment, then a stationary period when the remedy had lost its effect, and an increase after the treatment had ceased.

Eulenburg[3] objects to the unrestricted sale of thyroid preparations, and reports a case in which an obese person produced very severe nervous and cardiac symptoms in himself by taking 6 tablets a day.

Fränkel[4] prepares **thyreoantitoxin** by precipitating an aqueous extract of the gland with neutral sugar of lead, evaporating, dissolving, and precipitating with ether or acetone. He gives an empirical formula of $C_6H_{11}N_3O_5$. This substance produced loss of weight in 3 corpulent men and in a fat dog. It did not produce a fall of blood pressure, but the pulse was accelerated. Kittens from whom the thyroid had been removed were temporarily restored to health by its injection. Fränkel states that it is a pure chemical body of well-defined chemical properties, and that it will prove to contain all the therapeutic properties of the thyroid gland. The preparation is made by extracting the glands with cold water and precipitating with acetic acid.

[1] Gaz. Hebdom. de Méd. et Chir., 1896, No. 21.
[2] Progrès méd., Feb. 1, 1896.
[3] Deutsch. med. Woch., Aug. 15, 1895.
[4] Wien. klin Woch., No. 48, 1895.

MYXEDEMA.

[Reports showing the beneficial action of **thyroid preparations** have been multiplied during the year. It suffices to note a few of these.] Hertoghe[1] has noted in the treatment by thyroid extract of 9 cases of myxedema, congenital or acquired, that growth was stimulated and intelligence improved, while the bodily weight first diminished, then increased with the increase of height. He also found in 6 cases of children, whose growth was stunted from various causes, that they began to grow, and sometimes rapidly, after this treatment.

A report of unusual interest is that of Murray.[2] The case was that detailed by the author 4 years ago, and the **first instance recorded in literature.** The present account is designed to show the permanence of the beneficial action of thyroid treatment. The patient gradually lost all symptoms of myxedema until she was wholly free from any indication of it, and remains so still. She has continued to take a dram of thyroid extract during each week.

Parker[3] records a striking instance of the beneficial action of thyroid extract in the treatment of cretinism. At 6½ years of age the patient was stunted, unable to sit or stand, stolid, soporose, and unable to speak to or recognize persons. The appearance was that of typical cretinism. The thyroid tabloids were given in doses of 5 grains every day, and in 6 months the child had the appearance of a healthy girl of 2 years of age; was able to sit up and to stand a little, and continued to improve, so that after a year of the treatment she was beginning to be quite well developed. No unpleasant symptoms were caused at any time, but the dose seemed as large as could be administered.

Administration of Thyroid Glands.—Lanz[4] states that the fresh thyroid glands are less toxic than various preparations of the glands, so that it is likely that many instances of so-called thyroidism are really instances of meat-intoxication. Overdoses of fresh thyroid gland, however, occasion a true thyroidism. This may even appear in the young of animals overfed with thyroin during pregnancy.

Huchard[5] advocates the administration of thyroid gland in its natural condition, rather than injections of the juice or extracts, because of the danger of septic infection, and the assurance that the gland is in a fresh condition. The dose is one lobe, 15 to 20 grains, in bouillon, slightly fried or raw and cut in small morsels.

Baumann[6] has obtained a substance from the thyroid gland of sheep which amounts to from 0.2 to 0.5% of the gland and possesses the therapeutic activities. It is almost as powerful as the corresponding quantity of the fresh gland. The substance is an iodin-compound, appearing as an amorphous powder insoluble in water, soluble in alcohol. It contains a notable percentage of phosphorus. The name thyroidin has been given to this substance.

[1] Bull. de l'Acad. Roy. de Méd. de Belgique, No. 9, 1895.
[2] Brit. Med. Jour., Feb. 8, 1896.
[3] Ibid.
[4] Cor. Bl. f. schweiz. Aerzte, No. xxii. p. 695.
[5] Jour. des Prac., No. 16, 1896.
[6] Zeit. f. Physicol. Chem., vol. xxi., 1895.

Magnus-Levy [1] has studied the effect of thyroid treatment upon the process of oxidation. The consumption of oxygen above the output varied from 10 to 25%. This indicates the consumption of fat amounting to 50 g. per day for an individual of 90 kg.—a comparatively small amount. The author further refers to the fact that there is a marked loss in Grave's disease, and attributes this to hyperthyroidism, while the diminished loss in myxedema is termed hypothyroidism. V. Noorden found an increase of oxidation amounting to 21%, and sometimes lasting as long as two weeks after the discontinuance of thyroid treatment. A similar increase of oxidation occurred in 1 case of Grave's disease under his treatment.

DISEASES OF THE BLOOD.

Methods of Examination.—Mayer [2] has investigated the sources of **error** in the estimation of hemoglobin **with Fleischl's instrument.** He finds that there are two sources: first, errors of estimation due to imperfect development of the color-sense, to a condition of fatigue, to personal equation, or to the degree of skill on the part of the investigator; second, errors due to imperfections of the instrument itself, difference in size of capillary tubes being the most common among these. Of the errors in technique, imperfect filling of the capillary tubes may cause an error, even when done by a skilled investigator, of more than 14%; in the filling of the cell, different colors are produced when the meniscus is concave or convex, and may cause an error of 5%; the position of the apparatus in relation to the light may cause a maximum error of 6.02%. The scale may be inaccurate and the prism not uniform, and he recommends that a careful scale be constructed for each instrument, testing it with accurately diluted solutions of hemoglobin. Consecutive readings differ in the average by about 2.2%; the maximum difference may be as much as plus or minus 13%. Mayer concludes that in order to get an accurate result by means of a number of examinations it is necessary for the eye to rest for a period between the readings.

Bremer [3] has contributed another article on his method of **diagnosticating diabetes by staining the blood.** His method consists of the preparation of a film of blood on a cover-glass; the fixation of this in a mixture of absolute alcohol and ether, made to boil by immersion of the glass containing it in warm water; and finally, the staining of the blood with eosin and methylen blue. The staining fluid is made by mixing equal parts of saturated aqueous solutions of eosin and methylen blue, collecting the resulting precipitate upon a filter; drying it and dissolving it after addition of small quantities of powdered eosin and methylen blue, in 33% alcohol. In specimens stained in this way he describes the red corpuscles of diabetes as assuming a bright green color, while those of nondiabetic blood are purple or madder-color. He claims to have discovered this reaction in about 50 cases of diabetes and glycosuria, and to have failed in the case of all other affections.

[1] Centralbl. f. innere Med., Apr. 25, 1896.

[2] Deutsch. Arch. f. klin. Med., Bd. 56, Heft. 1-2. [3] N. Y. Med. Jour., Mar. 7, 1896.

The reaction occurred in all forms of glycosuria, excepting in a case of the experimental form caused by phloridzin in rats and in a case of diabetes, with 6.5% of sugar in the urine, in a young boy. Both of these cases should, he claims, be looked upon as essential kidney-diabetes, while the other cases are hematogenous. He suggests that there is some substance in the red corpuscles which gives the peculiar staining-reaction. It is not sugar, and is probably in combination with hemoglobin. [The positive assertions of the author would lead us to believe the method suggested one of great importance. Unfortunately, we have found the test of little value. In our own experience the same green coloration of the erythrocytes occurred in cases in which no glycosuria existed, and was not present in cases in which this condition was present.]

Polycythemia Rubra.—Grawitz[1] has studied the effect of circulatory disturbances upon the blood. He found that with the occurrence of the disturbance of compensation the water of the entire blood and of the serum increases, especially that of the latter. This he explains by the diminished blood-pressure and the absorption of water from the tissues. By tying an artery of a dog the blood of the area of supply was found to diminish in specific gravity by .003, while the dry residue and serum diminished 1.3% and 0.3% respectively. The increased thickness of the blood in chronic disturbances of the circulation he believes is due to loss of water through the lungs; at all events, he holds that there is no increased formation of corpuscles. The blood of the finger-ends he found to be constantly somewhat more concentrated than that of the veins.

Hayem[2] records a case of congenital heart-disease with marked cyanosis, in which the blood-examination showed 7,523,000 red corpuscles and 9920 white corpuscles, while the hemoglobin value of the red corpuscles was 76%. Hayem inclines to the view that the number of the corpuscles in such cases is elevated for the purpose of supplying a greater amount of oxygen-carrying material, and refers to the increased number of corpuscles occurring at high altitudes as being analogous.

Grawitz[3] opposes the theory that the increased number of corpuscles found in the blood of persons residing at considerable elevations is due to the increased formation of corpuscles dependent upon the greater need of oxygen-carrying matter. The increase in number of corpuscles is so rapid that the occurrence of nucleated forms must surely occur, if the explanation given were trustworthy and if our views regarding the occurrence of nucleated corpuscles in conditions of rapid hemogenesis are well founded. Furthermore, the occurrence of such increased formation of blood without notable symptoms of other kinds seems to him doubtful. Finally, he calls attention to the fact that the amount of hemoglobin does not increase with the increased number of corpuscles, and that, indeed, it often decreases; further, there is no evidence of an increase of plasma leading to a plethoric state. Finally, when the patients return to a lower elevation it is notable that symptoms are wanting, and in

[1] Deutsch. Arch. f. klin. Med., 1895. [2] Méd. moderne, No. 50, 1895.
[3] Berl. klin. Woch., No. 33, 1895.

particular that jaundice or other evidence of destruction of the supposed excessive number of corpuscles does not occur. His own explanation, based upon theoretic and experimental evidence, is, that at higher altitudes, in consequence of dryness of the air and the increased respiratory movements, there is a rapid loss of water from the body, and the blood in consequence suffers inspissation with apparent increase of the number of red corpuscles.

The Leukocytes.—Linsey [1] states that he finds, in studying the blood of persons broken down in health, that the white cells contain a greater or less number of vacuoles, and the living matter presents a dull, lustreless appearance, very little refractive.

Gumprecht [2] believes that it is possible to determine histologically the leukocytic degenerations and destruction which lead to the formation of uric acid and alloxins. The characteristic feature of the leukocytes undergoing destruction is disarrangement of the chromatin of the nucleus and indistinctness of the latter. This may be well marked in leukemia, especially in acute cases. In the latter it may affect 10% of the lymphocytes. In chronic leukemia it is seen in the so-called markzellen.

Kuehnau [3] has investigated the **relation of leukocytosis to uric-acid excretion.** He holds that the leukocytes are principally, if not exclusively, the source of the formative materials of uric acid. Increase of uric acid occurs when leukocytosis develops, and is quite independent of fever, since cases running a pyrexial course—as, for example, cachexial leukocytosis—showed increase of uric acid like the febrile cases. Rapid subsidence of leukocytosis is attended with increased excretion of urates. Injection of nuclein and the administration of aseptic pus, suspension of the thymus glands, and the like also cause increase of uric-acid excretion.

Stienon [4] has studied the question of **leukocytosis in pneumonia.** Regarding the morphology, he finds that the polynuclear forms predominate during the febrile stages, the eosinophiles being scarce. After the crisis the small mononuclear elements increase gradually, but in cases of slow resolution the polynuclear remain abundant. The eosinophiles increase as soon as the polynuclear begin to diminish, this occurring early in mild cases, and very slightly or not at all in cases in which suppuration occurs. In some cases the mononuclear forms predominate, this condition persisting during convalescence, and being often accompanied by increase of eosinophiles. The author was unable to observe the stage of preliminary hypoleukocytosis.

Jakob [5] records a series of 15 experiments to determine the manner in which increase and decrease of the number of **leukocytes** occurs **after injection of albumoses.** Unlike Löwitt and Richter, he did not find in any cases alteration in the alkalinity of the blood. The diminution of leukocytes may be asserted to be due to their temporary arrest in the internal organs rather than to destruction.

[1] Med. Rec., Nov. 16, 1895.
[2] Centralbl. f. innere Med., Apr. 25, 1895.
[3] Zeit. f. klin. Med., 1895, Nos. 4, 5.
[4] La Presse méd., July 13, 1895.
[5] Fortschr. d. Med., Apr., 1896.

Pichler[1] has experimented with pilocarpin, nuclein, and antipyrin to determine their influence upon the **number of leukocytes in pneumonia and typhoid fever.** He found increase of the leukocytes following the injection of pilocarpin and nuclein in a number, but not all, cases of pneumonia in which the number of leukocytes had been small. In some cases the number of leukocytes, on the contrary, decreases; similar results were obtained in typhoid fever.

Stein and Erbmann[2] have published most interesting studies of **the leukocytes in tuberculosis.** In beginning phthisis the number of leukocytes is normal; in advanced cases without cavities the number is also normal; but after hemoptysis or cavitic formation leukocytosis is observed; also in cases in which there are other suppurative or carious processes or exudation and hyperplasia of the lymphatic glands. Leukocytosis is therefore of diagnostic importance as indicating cavities when the other causes are absent. They hold that the increase of white corpuscles is due to secondary infections, and not to the tuberculous poison itself.

Wharthin[3] carefully studied **the leukocytes in** 2 cases of **acute miliary tuberculosis.** He found that a hypoleukocytosis was constantly present in both cases. Relatively, there was a marked increase in the polynuclear and transitional forms, and a decrease in the large mononuclears. Eosinophile cells were never found.

Hemolysis.—Biondi[4] has conducted some investigations and observations regarding the seat and nature of hemolysis. He concludes that this occurs after injection of hemolytic substances only in the liver, and that pigment occurring in the spleen is due to the transportation of cells containing degenerating corpuscles or hemosiderin from the liver through the circulation. He was able to demonstrate such cells in the blood of the subclavian vein at the mouth of the thoracic duct, and in the lymph in the thoracic duct itself.

Wenzel[5] records a case of **poisoning by lactophenin** coming on after two weeks' administration of the drug, 1 gr. being taken daily. Suddenly intense jaundice appeared, the stools became light colored, the urine was dark and contained bile. The symptoms slowly subsided. The author attributes the symptoms to destruction of the red corpuscles by paramidophenol. Similar cases have been recorded by others, but in these the dose had been larger.

SYMPTOMATIC ANEMIA.

Reinert[6] has determined **the hemoglobin in** a variety of **neurotic disorders,** and finds that in cases of functional nervous disease, such as hysteria, neurasthenia, it is generally reduced. In one case it was between 30 and 40%.

Capps[7] has made a study of **the blood in general paralysis, and**

[1] Zeit. f. Heilk., Bd. xvii., p. 43. [2] Deutsch. Arch. f. klin. Med., Bd. 56, p. 323.
[3] Med. News, Jan. 25, 1896. [4] Beiträge z. Path. Anat. u. Allg. Path., vol. xviii. H. 1.
[5] Centralbl. f. innere Med., No. 6, 1896. [6] Münch. med. Woch., 1895, No. 14.
[7] Am. Jour. Med. Sci., June, 1896.

also the changes noted before and after **convulsions and apoplectiform attacks.** The study of the blood in the course of the disease shows a slight fall in specific gravity and moderate increase in the number of red corpuscles. The average number of leukocytes was 22% above the normal. The differential count showed a decrease in lymphocytes with a commensurate increase in the large mononuclear cells. In a few cases the eosinophiles were notably increased. The study of the blood in relation with the seizures showed increased red corpuscles and hemoglobin at the time of the convulsions, and decrease after an attack of long duration. Leukocytosis is brought about by the seizures, appearing within a short time of the convulsion or probably not until the convulsion has begun. The intensity and the duration of the leukocytosis vary with the length and severity of the attack. The large mononuclear cells are relatively more increased than other varieties. The author believes the latter fact, and also the fact that mononuclear cells with dark staining nuclei and neutrophilic granules are found, indicate that the theory of leukocytosis being merely a change of distribution of leukocytes is fallacious. [We cannot entirely agree with the author in this, as it is not unlikely that the different forms of leukocytes would be differently affected by influences which are supposed to restrain the leukocytes in the capillaries on the one hand or cause their discharge into the general circulation on the other hand. So far as the peculiar transitonal leukocytes are concerned, we feel the facts are too few to warrant any theories.]

Rochester[1] suggests that **the systolic murmur heard at the aortic valve in anemia** is due to the fact that the blood, being of insufficient weight, has not momentum enough to force the valves flat against the walls of the aorta, and as a result they hang out into the lumen of the vessel and produce an obstruction. The same explanation applies to the pulmonic valve. Regurgitation might be caused by dilatation of the ventricle due to fatty degeneration.

Treatment of Symptomatic Anemia.—Quincke and Hochhaus, at the Congress of Internal Medicine,[2] reported their investigations of the **absorption and elimination of iron.** These experiments were carried out upon mice, and the studies were made by microchemical methods. It was found that the iron of the food or that administered is absorbed exclusively from the duodenum. The elimination of iron takes place from the large intestine and cecum, and by the aid of the leukocytes and epithelium rather than through the glands. Kunkel[3] publishes experiments upon two dogs which indicate that the administration of iron increases the amounts of iron in the various tissues of the body as well as in the blood. The first dog was fed on milk, with the addition of a liquid preparation of albuminate of iron; the second with milk without such addition. The animals were bled from time to time, and the amount of iron abstracted was estimated. After 8 weeks both

[1] Med. News, Dec. 7, 1895.

[2] Centralbl. f. innere Med., Apr. 25, 1896; Berl. klin. Woch., Apr. 20–27, 1896.

[3] Pflüger's Archiv, Bd. lxi. p. 595.

animals were killed, and the amount of iron was found to be $1\frac{1}{2}$ times as great in the blood of the dog which received the iron as in the other, while the amount in the liver was 8 times as great. In all organs there was an excess.

DaCosta [1] after considerable experiment finally discovered a compound of **iron** which was stable and nonirritating, and therefore suitable **for hypodermic employment.** This is the "ferrous manganese citrate." He reports 3 cases of secondary anemia treated by this method with great improvement. He considers that he is the first one to have published cases in which iron was used hypodermically. In conclusion he states that the dose for hypodermic use should not, in the beginning, be more than one-half of that given by the mouth. He himself has never seen any disagreeable complications from its use.

De Francesco [2] reports 3 cases of severe anemia in which injections of **mercuric chlorid** and **quinin** were used with good results. The cases were not specific in nature. [We have ourselves obtained striking results from protracted administration of small doses of mercuric chlorid.]

Touatre [3] declares that inhalations of chemically **pure oxygen** is the most efficacious remedy in diseases of the blood, increasing the number and the energy of the red corpuscles, multiplying the leukocytes, and facilitating the elimination of the toxins. Among other diseases, it is useful in nephritis, particularly the acute forms.

Caroline Pease [4] reports 7 cases of simple anemia treated with **bone-marrow.** The preparation used was made by macerating finely broken sheep's ribs containing red marrow in glycerol for 4 days at a temperature of 70° F. and straining the resulting liquid. As much as a dessertspoonful could be given 3 times daily, but more than this proved laxative. Under this treatment in the course of 5 weeks the hemoglobin was increased from an average of 47% to an average of 87%, and the number of red corpuscles from an average of 4,084,000 to an average of 4,731,000. The leukocytes decreased from 15,000 to 6000.

Watkins [5] reports a case of anemia in which **carnogen** in doses of 2 drams 3 times a day was given, and all other treatment suspended. The patient rapidly improved and the blood became normal. Taube [6] used somatose in doses of 10 g. per day with excellent results in post-typhoid anemia and in chlorosis. Richardson [7] found ferratin useful in 5 cases; while Reimer and Frisch [8] advocate corniferrin, though gastric disturbances occurred in 2 cases.

Venesection.—Koeppe [9] has studied the effect of venesection experimentally. He particularly calls attention to the fact that nucleated red corpuscles occur at the time when the red corpuscles reach their lowest number,

[1] Therap. Gaz., May 15, 1896.
[2] Gaz. degli Ospedali, Feb. 4, 1896.
[3] New Orl. M. and S. Jour., June, 1896.
[4] New York State's Hospital Bulletin, 1896, No. 1.
[5] Am. Med.-Surg. Bull., Mar. 7, 1896.
[6] Wien. med. Woch., Apr. 11, 1896.
[7] N. Y. Med. Jour., Apr. 18, 1896.
[8] Wien. med. Woch., May 16, 1896.
[9] Münch. med. Woch., No. 39, 1895.

and further refers to the large numbers of microcytes, believing these to be formed by segmentation of the red corpuscles so as to form a greater surface for purposes of oxygenation. Ziegelroth[1] found that the specific gravity of the blood decreases greatly in the blood of the lobe of the ear after venesection, but increases above the normal in 6 hours, and reaches the normal again in 12 hours.

CHLOROSIS.

Charrin[2] regards chlorosis as a menstrual autointoxication, due to insufficient development of the genital organs in consequence of hereditary influence and the retention of toxic elements normally excreted with the menstrual discharge. [This return to the theory of Hippocrates is interesting as an instance of reversion of opinion to ancient belief.] Hunter[3] in a discussion on pernicious anemia points out that the supposed intestinal origin of chlorosis, according to the views of Sir Andrew Clark, is founded rather upon a clinical than an experimental basis. He himself holds to the hemogenic origin of chlorosis. He does not deny that it is a form of intestinal anemia, but maintains lack of proof. Stockman[4] holds that excessive menstrual loss or less frequently other forms of hemorrhage are important. The insufficient ingestion of iron with the food, resulting from want of appetite, and possibly an inherent want of blood-making power in certain persons, are also important. Henry[5] in discussing chlorosis classifies it as one of the primary anemias. He recognizes 3 types—that in which the corpuscles are of normal size and number with deficiency of coloring matter; that in which they are diminished in number with deficiency of coloring matter; and that in which they are diminished in size, but of normal number and normal percentage of coloring matter. He believes that iron is the most efficient therapeutic agent. [The importance assigned by the author to reduction in the amount of hemoglobin is such as our experience would lead us to assume. The opinions of those who hold that the relative decrease in the amount of coloring matter is a "phenomenon of regeneration"—that is, a secondary result growing out of the more rapid regeneration of corpuscles than hemoglobin—certainly want confirmation.] Townsend[6] records a series of cases of chlorosis with the particular intention of illustrating the value of treatment. In the first series there were 87 cases in which the percentage of hemoglobin varied from 18 to 72, the average being 35.5. The youngest patient was 15 and the oldest 34. The most constant symptoms were the cardiac and the arterial. Headache was present in 74%, dyspepsia in 75%, constipation in 65%, irregular and scanty menstruation in 54%, and profuse menstruation in 11%. In 2 cases the menses had never occurred. Regarding the general appearances, it was found that the condition of the nails was the best indication, pallor having occurred in this situation in 95% of the cases. The condition of the conjunctiva was notably

[1] Virch. Archiv, cxli. 2, 1895.
[2] Gaz. Hebdom. de Méd. et Chir., Jan. 2, 1896.
[3] Brit. Med. Jour., Feb. 8, 1896.
[4] Ibid., Dec. 14, 1895.
[5] Univ. Med. Mag., Aug., 1895.
[6] Boston M. and S. Jour., May 28, 1896.

unreliable, the color being pale in 64%, fair in 25.5%, and quite good in 10.5%. The statistics regarding the arterial murmurs agree with those of other writers. Stockman[1] gives the statistics of 63 cases of chlorosis, in all of which there was a great deficiency of hemoglobin, and generally also of the red corpuscles. In 3 of the cases poikilocytosis was extreme, in 10 marked, and in only a few no alteration whatever; 12 of the cases suffered from amenorrhea and 39 from disturbances of menstruation; in only 4 was menstruation normal; 11 of the cases were suffering from a second attack, and 22 had had frequent attacks, some being properly described as cases of chronic chlorosis.

Treatment of Chlorosis.—Fütterer[2] suggests a novel method of treatment for cases of chlorosis with hypoplasia of the heart and aorta. The enlargement of the vascular channels found postmortem in case of beer-drinkers suggests to him that increasing the quantity of liquids may serve to dilate the heart and vessels, and thus beneficially influence chlorosis, and possibly prevent the development of other diseases dependent upon hypoplasia of these structures, notably tuberculosis. He orders the patients to continue their usual mode of living for two days, and to measure all the liquids they take. The average quantity being found, he orders a quart more of milk to be taken each day until the highest possible limit has been reached. Different patients range between 3 and 9 quarts daily, while most of them will take from 5 to 6 quarts, this being in addition to the quantity they used before the treatment began. They may take pure or boiled milk, or, if this occasions inconvenience, milk and water. The patients increase rapidly in weight, the increase in his cases varying between 3 and 35 pounds within 4 months. The iron-treatment then proves entirely satisfactory, though before it had been unsuccessful. [Undoubtedly forced feeding is useful in the treatment of chlorosis, though the beneficial effect may not result as the author believes.]

Townsend[3] has investigated the value of **intestinal antisepsis** in the treatment of chlorosis. In 30 cases beta-naphtol was given, cascara being used for constipation; in 31 cases Blaud's pill (5 gr. 3 times daily), cascara being used in these cases also. In the first series the improvement per week in hemoglobin averaged 1.85%, in the second group 5.07%. Catharties alone were used in 7 cases, and the improvement amounted to 1.50%. Blaud's pill after a preliminary treatment with beta-naphtol was employed in 12 cases, and the improvement amounted to 6.7%. Blaud's treatment without the preliminary treatment was used in 19 cases, and the improvement was 4.5% per week. Later a series of cases were treated with a combination of beta-naphtol and Blaud's pill, and the average improvement was 7.9%. It will be noted that the last was the most favorable result of all. Stockman[4] in discussing the treatment of chlorosis holds that clinical experience has shown **iron** to be the most important remedy, but the administration should be continued as long as 8 or 10 weeks. The choice of a preparation must be guided

[1] Edinb. Med. Jour., Nov., 1895.
[2] Jour. Am. Med. Assoc., Nov. 30, 1895.
[3] Loc. cit.
[4] Loc. cit.

by the condition of the stomach. No one preparation can be said to be better than another. Large doses are probably more efficacious than small. Manganese or arsenic is either useless or unnecessary. Finally, he refers to the importance of diet, rest in bed, and proper surroundings.

PERNICIOUS ANEMIA.

Pepper[1] reports a case of pernicious anemia due to ileocolitis. The patient presented the characteristic features of Addisonian pernicious anemia, the general appearance as well as the condition of the blood being pronounced. There were considerable mucous colitis and gastric disturbances. Lavage of the intestines was practised with striking results, the patient leaving the hospital in a few weeks much improved. [Subsequently the patient reports progressive increase in weight and strength. The interesting case of Juergens, in which similar improvement occurred after free purgation and discharge of immense numbers of bacteria termo. is analogous; and both cases speak in favor of the view that pernicious anemia may be of gastrointestinal origin.]

Bowen[2] reports that in a case of intense anemia in Barbados he found numbers of **ankylostoma** in the intestinal tract postmortem. Investigating the injections from another case of anemia, coming from an entirely different part of the island, he found eggs of the characteristic appearance. Administration of anthelmintics and purges brought away numbers of the parasites. This seems to be the first contribution indicating the occurrence of ankylostomiasis on the island of Barbados. [European writers have stated that ankylostomiasis occasionally occurs in certain parts of the United States, but there seems to be little evidence in favor of this view. In our own somewhat hasty examination of the literature we find no recorded cases in native Americans, and only 1 instance in an immigrant.]

Herrick[3] reports a case of extreme anemia, showing all the characteristics of pernicious anemia, **following a fall** upon the sidewalk in which the patient hurt his back and left side. The red corpuscles were reduced to 600,000, and there was a slight relative increase in the leukocytes, particularly the lymphocytes. The hemoglobin was 25%. The patient improved markedly under arsenic and passed from observation. In the discussion that followed Musser reported 2 cases following, if not due to, nervous influences. Anxiety and grief in these cases were followed by severe digestive disturbances, and these by the alterations in the blood.

Stockman[4] has published **analyses of the liver and spleen** showing the amount of iron per 100 g., and in the whole organ in various diseases. From these analyses it appears that the view that has been held by some that pernicious anemia is the only disease in which increase of iron occurs in these organs is unfounded. In defence of his previously published view, that the iron deposits of pernicious anemia are dependent upon the absorption of internal hemorrhages, he cites the fact that the cases studied by him were cases in

[1] Med. News, Nov. 23, 1895.
[2] Internat. Med. Mag., Apr., 1896.
[3] Jour. Am. Med. Assoc., June 20, 1896.
[4] Brit. Med. Jour., May 2, 1896.

which interstitial bleedings had taken place, while in those cases of fatal anemia where the blood-loss was external there was very little iron in the organs. Further, after artificially-made subcutaneous hemorrhages in rabbits and during absorption of large external hemorrhages in man (hematocele, scurvy), iron is plentifully deposited in the liver and a large amount of yellow pigment is formed from the hemoglobin.

Hunt [1] reports 3 cases of pernicious anemia which were treated with extract of **bone-marrow.** The first case improved so rapidly under arsenic by the mouth that no other treatment was tried until a return of the condition occurred 5 months after discharge from the hospital. No improvement occurred, and the patient died. The second patient, also improved under arsenic, was discharged and remained well for 18 months. Red bone-marrow was used at first during the relapse, and, no improvement being apparent, arsenic was again tried, but unavailingly. Yellow marrow was then tried, but the patient died 4 days after it had been commenced. The third patient was kept for a week without treatment, and then given red bone-marrow for 3 weeks. No improvement taking place, she was given arsenic, and the blood and general health rapidly returned to normal. He concludes that the red marrow did not have the slightest effect in any of the 3 cases. Hunt sees no rational explanation for the use of bone-marrow in anemia, for digested bone-marrow can hardly aid in the formation of new corpuscles, and as the existing bone-marrow is hypertrophied, there is no reason to suppose that the organism lacks any substance that it may secrete.

Danforth [2] reports an interesting case of pernicious anemia in which, after trial of the various forms of iron, intestinal sepsis, and arsenic without benefit, bone-marrow was administered—at first the yellow marrow, raw, by the mouth, and later a glycerol extract of red marrow. Improvement took place, which continued for some months, and was then followed by relapse, until, at the end of 18 months after the institution of the marrow treatment, it apparently lost its effect and the patient died. Danforth believes that life was prolonged for at least 18 months. A case of pseudoleukemia was treated in the same manner with most extraordinary improvement, followed in 2 months by a fatal relapse. He has also used it in a number of cases of simple anemia with beneficial results, finding a glycerol extract of red marrow to be most efficient. In the discussion that followed Smith of New York reported a case that presented a period of extraordinary improvement without any treatment whatever; Henry of Philadelphia, a case that had been cured for 2 years by the use of enormous doses of arsenic; Hare of Philadelphia, a case that showed 2 periods of marked improvement, 1 under arsenic and 1 under no treatment.

Stengel [3] believes that pernicious anemia is **a hemolytic disease** in which the hemogenesis may or may not be equal to the normal, although always insufficient to cope with the hemolysis, and that the hemolysis originates in the gastrointestinal capillaries as a result of the absorption of toxic

[1] Lancet, Feb. 1, 1896.

[2] Chicago Clin. Rev., June, 1896.

[3] Ther. Gaz., May 15, 1896.

substances. He considers all cases in which a maximum degree of oligocythemia with microcytosis, macrocytosis, and poikilocytosis occurred, and in which nucleated red corpuscles were discovered, and the hemoglobin was relatively excessive or at least approximately equal in percentage to that of the corpuscles, as pernicious anemia. He divides the treatment under three heads: specific, that directed to the general conditions of the circulation, and treatment of the intestinal conditions and underlying affections. The specific treatment consists in the use of iron, arsenic, and bone-marrow. Iron he considers of little value, but arsenic, he thinks, acts in some way to prevent blood destruction, and perhaps also as a stimulant to hemogenesis. He reports 2 cases in which marked improvement was obtained by the persistent use of this drug. Bone-marrow apparently acts differently according to the preparation that is employed. He reports 2 cases in which this treatment was employed; in the first a glycerol extract of marrow and large doses of arsenic had had no effect, but "red bone-marrow jam" produced immediate and extraordinary improvement. In a subsequent relapse it was of no value. In the second case the patient was far advanced in the disease, and no effect was produced. Of the treatment designed to improve the conditions of the circulation, perhaps the most valuable are colonic douches employed to relieve the quantitative anemia. Intestinal antiseptics usually fail to control fermentative processes, and their use in pernicious anemia is therefore doubtful. [A careful study of the reported cases in which bone-marrow has been used leads to the conclusion that no dogmatic statement is warranted. Our own experiences in some 4 or 5 cases have been conflicting.]

Patera[1] reports a case of severe anemia (pernicious anemia) in which the usual plans of treatment were adopted without striking effect. Later, **mercuric chlorid injections** were used, 5 mg. being administered daily for 2 months. Under this treatment the anemia disappeared and the patient improved in every way. The author also refers to 2 other cases in which this treatment was employed with excellent results.

Ewald[2] reports a case of extreme anemia having the features of pernicious anemia in which, as a last resort, **transfusion** was practised. The blood was taken from the patient's wife, defibrinated, and injected into the vein, the amount being about 85 cc. There was slight improvement immediately, but stimulants were required during the following night. On the second day the strength gradually returned, and by the third day the blood showed 1,250,000 red corpuscles and 29% hemoglobin; after 2 weeks there were 2,300,000 red corpuscles and 33% hemoglobin; while 5 months later the hemoglobin was the same, though the red corpuscles had increased to 3,500,000. The author discusses the pathology of the disease, and inclines to regard it as a form of intoxication, believing, moreover, that transfusion of blood may exercise an antitoxic or neutralizing effect which gives the body time to regain strength. The patient reported received arsenic in various forms with tonics and intestinal antiseptics throughout the case. [The case is instructive in showing

[1] Riforma Med., May 28, 1896.

[2] Berl. klin. Woch., No. 45, 1895.

the effect of injection of liquid at a time when the circulation is at its lowest point. It is inconclusive as illustrating any special effect derivable from blood transfusion, and the assumption that the blood exercises antitoxic power is purely theoretical. The increase of the number of corpuscles without increase of hemoglobin is characteristic of the disease, as it is also a usual condition in other anemic affections during the stage of regeneration of the blood.]

LEUKEMIA.

Mannaberg [1] reports a case of lymphatic leukemia in which the lymphocytes were found to contain sharply circumscribed colorless bodies which showed ameboid movements even when cold. Staining showed that these were not products of cellular degeneration. The author believes them to be **protozoa,** and refers to cases of leukemia in literature which recovered under the use of quinin (Mosler, Ehrlich). His own patient lost 5 kg. in 3 weeks while taking this remedy, and the author attributes this to reduction in the tumors.

Hindenburg [2] believes that leukemia is due to a **mitotic increase of a certain kind of leukocyte** in a pathologic manner as a result of the action of some cause as yet unknown. He thinks that the idea that the leukemic condition of the blood is due to decreased leukolysis cannot be true, because he finds numerous degenerated forms in the organs.

Robison [3] reports a case of **splenic leukemia,** in which, 6 years before admission, a small painful tumor was noticed in the region of the spleen. There had been repeated injuries to this region of the abdomen. The blood contained 1,820,000 red blood-cells per c.mm., and the proportion of white to red was 20%.

Symptoms.—Kast [4] reports a case of leukemia in which **priapism** suddenly developed and continued for 2 months, subsiding slowly and permanently. At this time leukemia was recognized by the enlargement of the spleen and condition of the blood. The patient died 6 months later, and the cause of the priapism was found to be excessive white thrombosis of the cavernous bodies; this had been followed by connective-tissue hypertrophy and induration.

Seelig [5] reports **a case of acute leukemia** occurring in a boy of 11 years. The boy had been ill for 2 years with postscarlatinous nephritis, when he began to lose strength and suffered with headache, nausea, and disturbances of his stomach. The spleen was enlarged, but the blood-examination was negative; 16 days later he had edema of the eyelids, enlargement of the lymph-glands, and swollen and bleeding gums. The blood showed great increase of leukocytes (1 to 5.4); there were pain and tenderness of the tibiæ and subcutaneous nodules and hemorrhages in the skin. Death occurred 4 days later, and the autopsy revealed the characteristic lesions of spleen, liver, lymph glands, bone-marrow, and other organs. Unusually large lymphomata were

[1] Centralbl. f. innere Med., Apr. 25, 1896; Berl. klin. Woch., Apr. 20–27, 1896.
[2] Deutsch. Arch. f. klin. Med., Bd. liv. S. 209. [3] N. Am. Pract., July, 1895.
[4] Zeit. klin. Med., Bd. xxviii. p. 79. [5] Deutsch. Arch. f. klin. Med., Bd. liv. p. 537.

found in the epicardium. Examinations of the blood had shown large numbers of myelocytes, but "granulations in Ehrlich's sense" could not be found. There were but few nucleated red corpuscles. A later examination of the blood and that made after death showed preponderance of lymphocytes.

Whait [1] reports a case of leukemia which seems to illustrate the usefulness of **bone-marrow** as a measure of treatment. At first arsenic was used without notable improvement for 17 days; then bone-marrow was added, and immediately the leukocytes decreased in number, falling from 340,000 to 190,000 in a few days. In the course of the next 2 weeks the number declined to 40,000, and subsequently became almost normal. Neuritis developed and bronzing of the skin was produced, so that arsenic was finally withheld. The patient disappeared from view in February, practically well, the spleen and blood having been normal for several months. In August she returned with the symptoms as marked as ever, the liver and spleen very much enlarged, and the leukocytes numbering 225,000. She was given tabloids of marrow with carbonate of iron, and there was immediate improvement. In 2 weeks the number of leukocytes had fallen to 41,000. (See Fig. 1.) She further

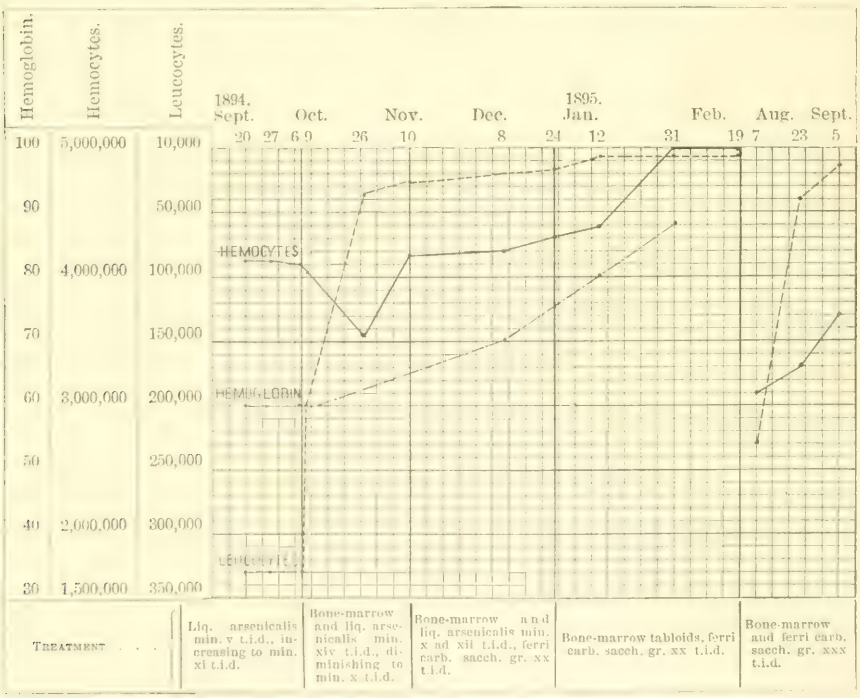


FIG. 1.—Chart showing improvement in the condition of the blood during the administration of bone-marrow (Brit. Med. Jour., April 4, 1896).

progressed favorably till the beginning of September, when pulmonary congestion and pleurisy supervened and the patient died. Nammack [2] reports a case of leukemia treated with fresh bone-marrow. The blood count showed at first

[1] Brit. Med. Jour., Apr. 4, 1896.

[2] Med. Rec., Dec. 14, 1895.

2,680,000 red cells and 864,000 white cells, or a ratio of 3 to 1; hemoglobin, 50%. The ratio gradually changed to 13 to 1, and the spleen diminished in size. A preparation of bone-marrow was used in the latter part of the cure.

Hodgkin's Disease.—Katzenstein[1] reports a case of pseudoleukemia of two months' standing in which there was marked anemia, moderate increase of the white corpuscles, with decided enlargement of the spleen, enlargement of the lymph glands, and troublesome prurigo. Subcutaneous injections of arsenic were employed and continued for 6 months, when the patient had almost wholly recovered, and continued so for 5 months.

Picou and Ramond[2] describe a case, similar to one detailed by Gaucher, as an instance of **primary epithelioma of the spleen.** Their patient was a young woman of 32 who had become gradually ill with enlargement of the spleen and a dull pain in the left side. Coincidently, the liver enlarged and the entire abdomen was swollen by these viscera. There was no ascites, and the hypertrophy of the organs was smooth and regular. Dyspepsia, constipation, dyspnea, frequent urination, edema, and at times cramps of the lower limbs were among the symptoms, while hemorrhages constituted a marked feature of the case. These took the form of epistaxis, subcutaneous hemorrhages, and the like, and the gums became soft and spongy as in scurvy.

Gaucher laid particular stress upon the absence of glandular enlargement and anemia without leukemic characters. The duration of the disease is protracted. The anatomical lesions consist in enlargement of the liver and spleen, both the organs presenting their normal shape. The spleen is paler than normal and the parenchyma sclerotic, the trabeculæ being much increased in thickness. Microscopically, the proper substance of the spleen is found to be destroyed, its place being taken by alveoli formed with thickened trabeculæ filled with sharply defined nuclei. The liver presents evidences of cirrhosis. The authors conclude that the disease resembles endothelioma, but were unable to trace an endothelial origin in their case, and were inclined to regard it as carcinoma. [The nature of these cases is very doubtful, but they may be included in this place as probable instances of lymphadenoma of unusual type beginning in the spleen. There seems little reason to classify them as cases of carcinoma.]

Banti[3] refers to the occurrence of **cirrhosis of the liver after splenic enlargement** in cases of anæmia splenica. He has observed 10 cases in the last 13 years. The anemia may precede the enlargement of the spleen or may follow it, while the cirrhosis of the liver is the last to occur. It presents the character of atrophic cirrhosis, but is an independent infection. He believes the sequence of events is primary irritation of the spleen by some poison, and secondary implication of the liver. Extirpation of the spleen sometimes causes recovery, which illustrates his view that the cause of the anemia occurs in the spleen.

Köster[4] records a case of splenic anemia or pseudoleukemia much improved

[1] Deutsch. Arch. f. klin. Med., Bd. lvi. H. 1–2.
[2] Arch. de Méd. exper., Mar., 1896.
[3] Sperimentale, Feb., 1895.
[4] Centralbl. f. innere Med., Jan. 26, 1896.

by the administration of **oxygen.** The patient, a man of 44, had influenza 2 years before, and suffered from general weakness, dyspnea, and palpitation. The complexion was yellowish, and red corpuscles numbered 800,000, while hemoglobin was but 25% ; there were numerous microcytes as well as poikilocytes. Under arsenic and quinin the patient grew worse; then inhalations of oxygen were given daily as a last resort. A considerable improvement at once set in, and in 2 days the splenic enlargement began to subside and the blood to improve. In a month an examination showed 3,800,000 red corpuscles and 75% hemoglobin, and 2 months later the spleen was normal in size.

ADDISON'S DISEASE.

Etiology.—Boinet[1] has experimented upon rats to determine the nature of Addison's disease. In 109 animals both suprarenal glands were removed; in 20 the glands were ligated; and in a series tincture of iodin, silver nitrate, and other cauterizing agents and pus from inflammatory and tuberculous lesions were injected. It was found that lesions of the glands led to accumulation of pigment in the blood and to pigmentation of the internal organs —in one-half of the cases in large quantity, in one-quarter of the cases in small quantity, and not at all in the remaining quarter. Sometimes there was marked paresis with gradual asthenia. Injection of an extract prepared from the muscles of such rats caused toxic and fatal results in other rats. Hansemann[2] reports a case of Addison's disease with autopsy, in which all the organs were found practically normal excepting the suprarenal bodies. In these there was absence of the cortical substance and some round-cell infiltration. Sibley[3] reports a case of Addison's disease occurring in a girl of 20 years. Upon admission she was nearly mulatto-colored, and there were deep bands of staining in the line corresponding to the pressure of the waistband and above the knees in the position of the garters, and patches of pigment on the mucous membrane. No physical signs of disease could be recognized. The patient died in collapse, and at the autopsy all the organs were found to be healthy with the exception of the suprarenal capsules, which were very hard, cutting like scirrhus and without distinction between cortex and medulla. No physiologically active extract could be obtained from the glands. Microscopically, the glands showed nothing but fibrous and caseous tissue in various stages of degeneration, with considerable small-celled infiltration in places. No tubercle bacilli were found.

Treatment.—[Theoretically, the use of extracts of suprarenal glands commends itself in the treatment of Addison's disease, and favorable reports have been reported. The number of cases, however, is small, and the results have not been wholly satisfactory.] Sydney Ringer and Phear[4] record a case of Addison's disease treated with suprarenal extract, and summarized 9 reported cases, 5 of which showed improvement, though a sufficient time had scarcely elapsed to determine whether the improvement was permanent. In 2

[1] Semaine méd., No. 8, 1896.
[2] Berl. klin. Woch., Apr. 6. 1896.
[3] Lancet, May 23, 1896.
[4] Brit. Med. Jour., Jan. 18, 1896.

cases there was no improvement, in 1 only a limited trial was given, and in 1 death occurred in spite of the treatment. Another case was a woman of 28 years who had presented the symptoms for 2 years; there was great disturbance of the stomach, excessive weakness, some loss of flesh and pigmentation of the face, hands, forearms, axillæ, about the knuckles, over the kneecap, and in the neighborhood of the toes and ankles. The mucous membranes were pigmented in patches. Suprarenal extract was given daily to the amount of 45 gr., and increased to 420 gr.; rapid improvement followed in the general condition as well as in pigmentation. The improvement continued for 4 weeks, when there was a decided change for the worse, and death occurred 6 weeks after the commencement of the treatment. In the discussion of this case Dr. Parkinson related the case of a man of 31 years under the care of Dr. Murrell treated in the same way without beneficial results. Murrell [1] reports a case of Addison's disease that was treated first with tabloids of suprarenal capsule extract, each representing 5 gr. of the extract 3 times daily. Nausea and vomiting were worse, and he lost weight. Four tablets increased the symptoms so much that the treatment was changed to fresh suprarenal capsules, taken at first from the sheep, and then the calf. The condition grew rapidly worse and death occurred.

Osler [2] reports at length 6 interesting cases of Addison's disease, in only 1 of which anemia existed. The most interesting case is the 6th. In this the symptoms were most marked, the pigmentation being extreme, with marked asthenia and emaciation. Tubercle bacilli had been found in the sputa. Upon the 16th of May treatment with suprarenal extract was begun. Fresh suprarenals obtained from pigs were extracted with glycerol, so that 1 dram of the extract equalled 1 dram of fresh suprarenals. Half a dram was given 3 times a day. Immediate improvement took place, and in 8 days he had gained 3 pounds in weight. Later the dose was increased and the improvement continued. By Sept. 10th he had made a total gain of 19 pounds, and was bright and active, and said he felt vigorous. Subsequently his condition remained good, he was enabled to work, and there was probably a slight diminution in the amount of pigmentation and the patches on the palate had completely disappeared. Curiously enough, the tubercular process was also favorably affected.

Francis [3] reports a case of Addison's disease in a young man of 25, and in which suprarenal extract was administered with striking results. The patient was first seen on Sept. 1st, when he was vomiting and presented an emaciated appearance. The skin was dark, especially around the eyes, on the backs of the hands, and in certain other localized portions. There were spots on the mucous membrane. He was put in bed, and tabloids containing 5 gr. of the dried gland were given 3 times daily; 2 days later vomiting ceased, and 2 days after that he was able to take solid food. In the next 9 days, with the same treatment and cod-liver oil and syrup of hypophosphites, he gained

[1] Lancet, Feb. 1, 1896.

[2] Internat. Med. Mag., Feb., 1896.

[3] Brit. Med. Jour., May 2, 1896.

strength so as to be able to walk without assistance. The improvement continued during October, and he gained flesh rapidly—at one time 2½ pounds in 9 days. The pigmentation was growing visibly less, and he went to London to seek work. A relapse occurred and the patient died. Autopsy does not appear to have been performed.

Stockton [1] reports a case of Addison's disease in which all the characteristic symptoms were extremely developed. Hydrochloric acid was not found in the stomach contents, and only a trace of lactic acid. Above the left kidney an irregular-shaped body, about the size of a hen's egg, was felt, supposed to be a diseased adrenal. The patient had been taking iron and arsenic; these were continued, and in addition 5 gallons of oxygen 3 times a day and 2 uncooked adrenals from a sheep were prescribed. Improvement was prompt and continuous, the blood count rising from 1,800,000 red cells and 30% hemoglobin to 4,000,000 red cells and 80% hemoglobin, whilst the bronzing rapidly faded.

Quine [2] reports a case of Addison's disease treated with suprarenal bodies. The medicine apparently disagreed with the patient, but she continued taking it, and on the 9th day a temperature of 100.5° was observed; 2 days later the temperature was 102°; there were nausea and extreme faintness. The treatment was then stopped, and death occurred 4 days later.

Hemophilia.—Wright [3] discusses the treatment of hemorrhages and urticarias associated with deficient coagulability of the blood. He found that in the case of a boy with very severe hemophilia the coagulation period exceeded 54 minutes at a temperature of 18.5° C. After two 2 g. doses of **calcium chlorid** it was diminished to 25 minutes, and after a further dose of 2 g. to 13½ minutes. At a later period the normal duration of coagulation was 14 minutes, but after 20.6 g. doses this was reduced to 6¾ minutes. Similar results were observed in the brother of this patient, who suffered from a less severe type of the disease. He mentions several cases that have come to his notice where hemophilic children prior to an attack of their disease exhibited a great desire to eat plaster and water. For the treatment of the hemorrhage itself he has found nothing so beneficial as the inhalation of carbon dioxid gas. As he has observed that the blood of hemophilic patients and of their femal ascendants is characterized by a notable paucity of white blood corpuscles, and especially by a relative paucity of the polynuclear white blood corpuscles, he advocates the employment of nucleoalbumins locally in order to promote the formation of a sound clot. According to his experience, wine has the effect of notably diminishing the coagulability of the blood, and therefore in cases of urticaria and hemophilic bleeding it is contraindicated.

Scurvy.—Neale,[4] being compelled to winter in the Arctic regions with very short rations, successfully avoided the development of scurvy in his party by the use of frozen fresh blood. Another party that wintered in the neighborhood and refused to take this precaution had scurvy very badly. He considers that scurvy begins with anemia and is largely due to improper hygiene.

[1] Med. News, Nov. 19, 1895.
[2] Jour. Am. Med. Assoc., May 23, 1896.
[3] Canad. Pract., June, 1896.
[4] The Practitioner, June, 1896.

DISEASES OF THE LUNGS AND PLEURÆ.

Miscellaneous.—Litten[1] in speaking of the **diaphragm phenomenon,** first described by himself, states that it achieves its greatest triumph in unilateral thoracic conditions. If absent on one side and normal on the other, there is a considerable effusion of liquid or air into the affected pleural cavity, or else pneumonia of the lower lobe. In the case of serous effusion slight diaphragmatic motions are often visible abnormally far downward. An area of dulness in the lower part of the thorax, not due to the liver or spleen, whilst the phenomena is visible above the dulness, but diminished, indicates subphrenic abscess. In a case of acquired diaphragmatic hernia the phenomenon was visible below the area of tympanites. The diaphragm phenomenon is the visible horizontal depression crossing the lower part of the sides of the chest and moving up and down with the respirations. It represents the movement of the diaphragm as the lower edges of the lungs become inflated or collapsed.

Cary[2] has made certain studies to determine the causes of the greater **vocal fremitus and vocal resonance** at the right apex than at the left. Casts made by filling the bronchial system with molten metal showed that the branch of the right bronchus supplying the upper lobe is given off close to the bifurcation, and thus the most direct and shortest column of air entering the lungs is that passing to this portion of the lungs.

Compte[3] describes the **phonendoscope** of Bianchi. This instrument, designed to permit the use of auscultation and percussion, consists of a shallow metal cup covered by a disk of ebonite, with a perforation in the cup to which are attached rubber tubes for the ears. From the center of the disk of ebonite arises a little rod with a button at the end. The button is placed over the organ to be examined and the tubes in the ears, whilst the finger is drawn over the skin, beginning at the point where the button is applied and running outward. As soon as the finger passes beyond the organ over which the button is applied the rasping bruit, heard before, ceases. This change of sound is said to be decidedly marked.

Robinson[4] mentions various **causes of cough** that are usually overlooked. Among these are enlarged lingual tonsils. Hemorrhage may occur in this condition, and is apt to be mistaken for hematemesis. Another cause, common in young children, is the development of the pharyngeal tonsil or lymphoid tissue at the vault of the pharynx. A third cause is one or more hypersensitive areas in the pharynx, the tonsillar region, upon the soft palate, or in the hyoid or epiglottidean fossa. A fourth cause is irritation of the auditory canal. Other causes are—a weak or dilated heart, pleurisy, an enlarged spleen or liver. The treatment suggested is of course local or removal of the cause, antilithic remedies, change of climate, etc. Babcock[5] speaks of the

[1] Med. Rec., Dec. 28, 1895.
[2] Amer. Jour. Med. Sci., Oct., 1895.
[3] Compt. rend. Hebdom. de la Soc. de Biol., Mar. 6, 1896.
[4] Am. Jour. of Med. Sci., Nov., 1895.
[5] Canad. Pract., Apr., 1896.

presence of lingual tonsils as the cause of chronic cough. He reports a case in which chronic cough and symptoms of congestion at the left apex were due to an enormously dilated left auricle in a case of mitral regurgitation.

Marie[1] discusses certain **thoracic deformities** that occur in medical affections. He first describes the funnel-shaped thorax, which has no pathologic significance; then the tailor-chest, shoemaker's chest, and the gutter thorax. All these deformities are very likely to occur in connection with other congenital malformations in the same individual. Frequently patients with a funnel-shaped thorax exhibit certain psychical deformities, and it is to be taken therefore as a sign of degeneration. Often many members of one family may present these deformities, and it must therefore be looked upon as a morbid condition of hereditary nature. The prow-shaped thorax or the boat-shaped thorax is often associated with congenital anomalies of the heart, and apparent deformities occur in the myopathies due to the degeneration and wasting of the muscles of the upper part of the chest. Another deformity that occurs in the myopathies is the wasp-waist, characterized by the almost vertical position of the ribs, and due to the flattening of the thorax, not unlike in its nature that which occurs in the skull of patients suffering from myopathies.

Thayer[2] reports 3 cases of **osteoarthropathy** associated with pulmonary lesions, and 1 case of acromegaly. The first patient was a Polish woman, 28 years of age, with pleural exudate in the lower left thoracic region. The ends of the fingers, particularly those of the right hand, were clubbed and a trifle expanded, and the lower ends of the tibiæ were thickened and slightly tender. The second patient had suffered with a severe cough for some time, and showed a universal thickening of the metacarpal bones, particularly at their distal extremities. The feet were large and heavy, but the most remarkable feature is the great thickening of the lower thirds of the tibia and fibula. The third case was a farmer suffering from pulmonary tuberculosis who had similar lesions, and in addition had great enlargement of the lower ends of ribs and ulna. The enlargements of the wrist were associated with considerable pain of a dull character, aggravated by movement. The fourth case was a woman of 41. The changes of acromegaly had commenced about 10 years ago, with swelling of throat. Later there were shooting pains. Measurements made at intervals of two years showed in general a slight increase in dimensions of all the bones. Thorburn and Westmacott[3] record the postmortem appearance of one of their cases of hypertrophic pulmonary osteoarthropathy. The patient was a lad. Postmortem examination showed tubercular disease of the lungs, spine, the right tibia, and the right suprarenal capsule. There was almost universal symmetrical involvement of the bones and articulations—a form of osteoperiostitis of the limb-joints, with erosion of the cartilages of these joints. Thorburn looks upon the condition as probably a diffuse but mild form of tuberculosis of the bones. He thinks the theory of Marie, that it is due to

[1] Gaz. de Hebdom. de Méd. et de Chir., Feb. 16, 1896.

[2] N. Y. Med. Jour., Jan. 11, 1896.

[3] Brit. Med. Jour., May 30, 1896.

absorption of ptomains, unsatisfactory. He also considers the theory of Bamberg, that it is due to venous congestion, unsatisfactory.

BRONCHITIS.

Sokolowski[1] reports 4 interesting cases of **acute fibrinous bronchitis,** and concludes that the disease is purely an infectious disease, probably caused by infection with the staphylococcus albus and aureus. The so-called chronic fibrinous bronchitis is probably entirely different etiologically from the acute form, in which pulmonary tuberculosis appears to play a subordinate part.

Claisse[2] reports a case of **chronic membranous bronchitis** in which streptococci were found in cover-slip preparations and on the surface of the membrane, probably coming from the saliva. The condition had lasted for some years and was constant. After the discovery of streptococci Marmorek's serum was used, and in two months the patient was discharged, much improved, expectoration having almost ceased. There was a distinct reaction to the serum. [The report is not convincing, either as proving the relation of the microorganisms or as showing the advantage of the treatment employed.]

C. Gerhardt[3] reports an interesting case of a young baker who suffered with pain in the side, cough, and dyspnea, followed by expectoration of milk-like character which showed the presence of starch when tested with iodin. Physical examination of the lungs showed some disturbances of the respiration at the right apex and rustling rales below. The patient continued to expectorate **sputa containing starch** during 2½ weeks after stopping his work, though the most careful cleansing of the mouth and pharynx was practised, and applications of iodin failed to determine the presence of starch in these parts or in the larynx. The author suggests that the condition was comparable to that occurring in persons who inhale **dust** in their occupations and expectorate sputa containing abundant dust-particles. He suggests that the asthma of millers and bakers may be due to the inhalation of flour and to its adhesive property. He found starch in the sputa of 3 bakers since the case reported came under his observation.

Stricker[4] discusses cirrhotic **atrophy of the mucous membranes** of the respiratory system, and reports 3 cases in which this was associated with the evidences of hereditary syphilis, which he considers of considerable etiologic importance; of these, 3 were remarkable for the fact that they suffered from albuminuria, either chronic or cyclic in type.

Sainz[5] divides **senile bronchitis** into four classes: ordinary chronic bronchitis, putrid bronchitis, bronchitis with gangrene, and bronchopneumonia. The most common microorganism associated with these appears to be the

[1] Deutsch. Arch. f. klin. Med., Mar. 26, 1896.
[2] Compt. rend. de la Soc. de Biol., Apr. 3, 1896.
[3] Centralbl. f. innere Med., May 16, 1896.
[4] Deutsch. Arch. f. klin. Med., Bd. 57, Heft. 1 and 2.
[5] Gaz. Hebdom. de Méd. et Chir., Jan. 12, 1896.

staphylococcus, although the streptococcus and the coli bacillus are also frequently found. He concludes that the bronchial mucous membrane is peculiarly susceptible in the aged, and to prevent, as far as possible, infection, he urges rigid hygiene in asylums.

Seifert [1] records an interesting case of **tracheal and bronchial stenosis.** The patient, a man of 43, had begun to suffer with difficulty of breathing a year previous, and finally respiration became almost impossible. When the patient came under the author's attention the laryngoscopic examination showed a moderate stenosis of the trachea at about the level of the third tracheal ring, and a more distant stenosis just above the bifurcation. There was also narrowing of the left bronchus. The treatment instituted was dilatation with suitably adjusted bougies, and the patient was eventually discharged in a much improved condition.

Duret [2] details a case of **bronchiectasis** in which recovery occurred after 3 operations. The patient, a girl, had suffered with the first symptoms after an attack of whooping cough at 8; at 18 the symptoms became pronounced, and at 21 the expectoration had become fetid and there was dyspnea. Three operations were done: first, aspiration with the trocar; then resection and evacuation through an opening made with the thermocautery; the third operation, 9 months later, consisted in the evacuation of other cavities with drainage; finally, the external wound was closed, and 2 years later the patient was in excellent health.

Treatment.—Thomson [3] in discussing the treatment of acute bronchitis declares that expectorant cough should be permitted as much as possible, and never suppressed. Irritating cough, on the other hand, demands sedative treatment. When both forms of cough coexist sedatives are indicated, but not in sufficient quantity to check expectoration.

Wessinger [4] advocates the use of **creasote** in the form of oleocreasote and of the carbonate in the treatment of bronchitis, gastrointestinal disorders, and tuberculosis. In the last-named affection the carbonate is preferable; in the others, the oleocreasote. The dose is practically unlimited so far as toxicity is concerned, but small doses are preferable—at the start 2 to 3 drops after eating. Glycerol forms a useful vehicle.

Chaplin [5] advocates the treatment of fetid expectoration by the **vapor of coal-tar creasote.** The value depends upon the penetrating, irritating, and antiseptic qualities of the drug. The method of application is to fill a small airtight chamber with the vapor of creasote, usually by boiling it over a spirit lamp, and then to place the patients in this chamber for as long a period as they can endure the treatment (a half hour being the maximum at first), but later they are able to endure it for an hour or more.

[1] Münch. med. Woch., July 30, 1895.
[2] Arch. gén. de Méd., Jan., 1896.
[3] N. Y. Med. Jour., May 16, 1896.
[4] Ibid., Oct. 5, 1895.
[5] Brit. Med. Jour., June 22, 1895.

PNEUMONIA.

Etiology.—Finkler [1] contributes most interesting studies of the relation of streptococci and influenza bacilli to inflammatory process of the lungs. He has observed in previous epidemics, as well as recently, forms of pneumonia which he regards as due, for the largest part, to streptococci, and which are characterized by a more or less definite clinical course. The same organism is of the greatest significance in the pneumonias attending chronic tuberculosis of the lungs. The onset of the inflammation is rarely marked by a distinct chill; rigor and flashes of heat, alternating, are more frequent, and profuse sweats are often observed. The cough and pain in the side may be present from the start; the patient most frequently remains unaware of the infection of his lung. The physical signs are likely to be irregular; partial dulness, bronchial breathing, and moist rales are most prominent. Anatomically and clinically the process is a lobular pneumonia. Postmortem there is discovered serous and cellular exudation in the air-vesicles and alveoli. Fibrin-formation is rare. While in previous epidemics he has found this a highly malignant as well as a contagious affection, commonly ending in death, of late he has found it more benign, and he has even observed cases like those of Wassermann in which the course was chronic. The latter are sometimes distinguished from tuberculosis of the lungs with difficulty, but the more irregular course, the more extensive inflammation of the lung, and the less marked tendency to softening are suggestive points of distinction.

Kennan [2] reports 3 cases of pneumonia in which the early occurrence of irritability of the muscles overlying the affected part of the lung was demonstrable. In another instance the condition was bilateral in a case first thought to be pneumonia, but afterward found to be tuberculosis. He refers to the fact that such irritability leading to fibrillary contractures on striking the side is well known in phthisis, but thinks it may be a useful point in the early recognition of pneumonia. [In a recent case one of the editors found marked irritability of the thoracic muscles for several days before the physical signs developed. The muscular tenderness accompanied neuralgic pain of the affected side.]

Smith [3] reports the **statistics** of 223 cases of pneumonia; 170 were males, with a mortality of 28%; 53 were females, with a mortality of 31.2%. The mortality increased very rapidly with age, varying from none below 10 years to 40.6% in those of 50 years and upward. Rheumatic diathesis did not seem especially unfavorable; diabetes, however, was an exceedingly serious complication. In 144 cases in which an initial chill occurred the death-rate was 34%; in those in which it was absent it was but 19%. Affection of the right lung was more serious than that of the left in the proportion of 29.8% to 25.5%. When both lungs were affected the mortality was 48.7%. The degree of fever seemed to have no influence unless 105° was passed, when the mortality

[1] Infectionen der Lungen durch Streptococcen und Influenzabacillen. Bonn, 1895.
[2] Dublin J. M. Sc., Feb., 1896.
[3] Med. Rec., May 9, 1896.

increased rapidly. The highest degree of leukocytosis that occurred in 8 uncomplicated cases was 41,000. In 1 case in which empyema developed the count was 54,500. A severe initial chill and rapid, feeble pulse are regarded by Smith as indications of severe infection, and he considers the second sound at the pulmonic cartilage as the most valuable factor in the determination of the course of the case.

Powell [1] opened an interesting discussion upon pneumonia before the British Medical Association. He collected and tabulated statistics which show that though the death-rate from zymotic diseases generally has decreased in the last decade, pneumonia still holds its own. The disease is particularly baneful in attacking and destroying mature persons, one-third of the deaths occurring in adults. Regarding the causation, he concludes that the Fränkel diplococcus is only one among several microorganisms having claims to being the specific cause. It is found in other conditions as well, and is met with in certain secretions in health. Predisposing influences have lost none of their old time significance. He offers an interesting table showing the elements of danger and the methods of meeting these:

Elements of Danger in Pneumonia.

Symptomatic.	Pathologic.	Effects.	Treatment.
High fever, above 104°	Microbic activity	Shock.	
	Exhausted nerve centers		Bathing; quinin.
		Sleeplessness	Morphin preceded by accumulative stimulants and food.
Pain	(1) Over-distention of capsule of lung from exudation and hyperemic swelling.	Nervous exhaustion.	Leeches; ice-applications.
	(2) Pleurisy		Blister + hot poultices (except very young and very old persons).
Rapid pulse (120) and breathing (40)	(1) Impaired pneumogastric innervation.		Strychnin, caffein, atropin.
	(2) Impaired nutrition of heart from insufficient and badly-aerated blood supply.	Cardiac failure	Oxygen-inhalations (earlier employment).
	(3) Over-distended right cavities		Stimulants.
	Depleted left cavities		Digitalis and strychnin; bloodletting, local or general portal depletion.
Extending physical signs.	Extending exudation.		Acid tonics, perchlorid of iron, after fifth day; oxygen-inhalations (later employment).

The discussion following the paper was full and interesting, but cannot be satisfactorily summarized in this place.

Stienon [2] finds that, as a rule, the **increase in the leukocytes** in pneumonia disappears with the increase in fever. In the febrile stage the polynuclear forms predominate, but as soon as these begin to diminish the eosinophiles begin to increase. This increase occurred early in mild cases.

Complications and Sequels.—Vogelius [3] reports 2 cases of croupous pneumonia in which arthritis occurred. In the first the right sternoclavicular articulation became involved on the fifth day, and seropurulent liquid containing diplococci was removed. In the second case there was first empyema fol-

[1] Brit. Med. Jour., Nov. 9, 1895.

[2] La Presse méd., July 13, 1895.

[3] Arch. de Méd. exper., Mar., 1896.

lowed by involvement of the hip-joint. This contained pus, and on examination diplococci, apparently identical with the microorganisms of Fränkel, were found.

Ruge[1] reports 2 cases in which **relapses** occurred in croupous pneumonia, and cites 7 others. The relapses usually occur after an afebrile period of from 4 to 15 days, during which time the symptoms are those of convalescence. The physical signs disappear, at least partially, and in the relapse reappear in the same place as in the first attack, or portions of the lungs previously unaffected may be involved. The duration of the relapses is from 4 to 8 days. Wandering pneumonia differs in its longer course, but transitional cases no doubt occur.

Dickinson[2] states that in 360 cases of pneumonia he has found **thrombosis** outside the heart in only 7 cases. Of these, 4 were young women and 3 were chlorotic. He further reports 3 fatal cases of thrombosis of the cerebral veins and sinuses in chlorosis. He believes that the occurrence of thrombosis in these channels is partly due to the fact that the cerebral venous blood is very slightly carbonized. It is of course also partly due to mechanic conditions. The lesser degrees of sinus thrombosis are not necessarily fatal, and he believes it more frequent than has been believed. In the discussion following the paper 2 fatal cases were reported by Duckworth, and Spurrell and Buzzard referred to cases.

Guinon and Bereau[3] report 2 cases of **subcutaneous abscesses** developed in the course of pneumonia. In both cases there had been slow resolution, then purulent pleurisy requiring resection of the ribs. Hypodermics of benzoate of caffein were given, and abscesses formed. These contained exclusively the pneumococcus.

Zuber[4] reports a case of pneumonia in which an abscess containing pneumococci in pure cultures developed at the site of a hypodermic injection.

Treatment.—Glass[5] has subjected **Sziklai's pilocarpin-treatment** of pneumonia to a careful test, and concludes that the administration of the drug in doses of 1 or 2 cgm. produces serious symptoms of collapse, and results in some cases in the rapid extension of the pneumonic process. A pronounced cure was never established. In delayed resolution, however, the remedy can be administered in these doses without producing unfavorable symptoms, and may effect a rapid solution of the pneumonic infiltration. [Our own experience with pilocarpin in cases in which pulmonary disease was present has coincided with that of Glass, and we should therefore hesitate to use the drug in pneumonia.] Sziklai[6] vigorously supports, against the criticisms of Glass, his original contention that pilocarpin is a specific, in the widest sense of the word, against all croupous diseases (those associated with a fibrinous exudate), curing laryngitis crouposa in a few hours and croupous pneumonia in from 2 to 3 days. He insists upon large doses, 8 to 10 cg. a

[1] Charité Annalen, 1895, p. 184.
[2] Brit. Med. Jour., Jan. 18, 1896.
[3] Bull. et Mém. de la Soc. des Hôp. de Paris.
[4] Semaine méd., No. 4, 1896.
[5] Centralbl. f. d. gesammte Therap, Oct., 1895.
[6] Wien. med. Woch., Jan. 18, 1896.

day, and denies that symptoms of collapse or other injurious action occurs. Heart-disease he admits to be a contraindication. Particularly in pneumonia with delayed resolution, as Glass himself admits, are the results of the daily administration of 1 to 2 cg. excellent. Unless the condition be very urgent Sziklai prefers administration by the mouth. Liszt[1] has treated 46 cases of pneumonia with pilocarpin after the method of Sziklai. The treatment was strikingly favorable in its results, the patient soon becoming quieted and the respirations becoming regular, and in the majority of cases the crisis ensuing after intense perspiration; the temperature, however, did not sink below normal at once. The degree of sweating is quite variable in different cases, and appears to be indifferent in this significance. The treatment exercises an immediate and progressive action upon the condition of the lungs, and in cases in which it has begun early resolution at once occurs, so that complete hepatization may never occur. Poulet[2] reports 108 cases of pneumonia following grippe, with 4 deaths, all being treated with pilocarpin hydrochlorate, as much as $\frac{5}{6}$ gr. being given at once.

Naegeli-Akerblom[3] used the fluid extract of **digitalis** according to the method of Petresco in 64 cases of pneumonia. Of these, 11 were fatal. Under 4 years of age not a single person died of pure croupous pneumonia: and of 9 fatal cases between the ages of 50 and 90 years, 7 were hopeless from the beginning. The shortest period in which the crisis occurred was 3 days. He concludes that in large doses digitalis increases the leukocytes, especially the polynuclear cells. Daily doses of 4 or 5 gr. are borne without injury.

Corin[4] has employed **digitoxin** in the treatment of pneumonia. He reports 26 cases that he observed very closely, and in which he systematically used the drug from the first visit; 2 of these died—1 who also suffered from extreme emphysema, and 1 that was moribund when the treatment was commenced. The duration of the disease after treatment was commenced was from 24 to 36 hours. The usual dose is about $\frac{1}{20}$ gr. in solution of chloroform and alcohol, taken in 3 parts at intervals of 6 or 8 hours. No unfavorable symptoms or cumulative action was ever noticed.

Edema of the Lungs.—Huchard,[5] referring to acute edema of the lungs, comments upon the gravity of this condition, and holds that it is due to disturbances of the cardiopulmonary innervation, to excessive pulmonary tension, and to sudden failure of the right ventricle. The best treatment is venesection from the arm, wet-cupping over the chest and liver, and subcutaneous exhibition of caffein, but, above all, of camphorated oil (1–5); 3 or 4 Pravaz syringefuls a day may be injected; the injections are not painful. Strychnin may be useful, but morphin is dangerous.

Bishop[6] commends very highly a large **thick jacket-poultice,** either made in one piece or in sections large enough to envelop the whole chest, and thick enough to retain its heat for some time, for acute edema of the lungs.

[1] Pester med.-chir. Presse, No. 4, 1896.
[2] Les Nouveaux Rémedes, 1895, No. 22, p. 507.
[3] Centralbl. f. innere med., Aug. 10, 1895.
[4] Therap. Woch., Aug. 11, 1895.
[5] Med. Press and Circ., Dec. 11, 1895.
[6] Am. Med.-Surg. Bull., Feb. 22, 1896.

Quincke[1] has tabulated 54 cases of **pulmonary abscess** treated by surgical operation. Of these, 17 were treated by the author, and he divides them into 3 groups: 1. Acute abscess, either simple or gangrenous; 2. Chronic abscess and fetid bronchiectasis; 3. Suppuration caused by a foreign body. In 83% of the 54 cases the lower lobe was the seat of the disease; 20 patients died, 20 recovered, and in 14 there was either failure or imperfect result. The mortality was about the same in acute and in chronic cases, but complete recovery is much more common in the acute cases, the chances of success being placed at 66%. He objects to exploratory puncture for diagnosis, as infection of the pleuræ may occur.

Lemaistre[2] discusses the **chalicosis** of workers in porcelain. He finds that the color imparted to the sputum is not due to pigment of hematogenic origin, but rather to the impregnation by particles of carbon, such as are found in all factories. In conclusion, he urges careful hygiene upon the part of the manufacturers, indicating that ample space and free ventilation are essential.

Actinomycosis.—Heusser[3] reports a case of primary actinomycosis of the lungs. The patient, a woman of 50, became ill with fever, showing elevations in the afternoon and with signs of right-sided pleurisy. Aspiration was practised, with the discovery of 600 c.cm. of clear pleural fluid. The apices were uninvolved; the sputa were small in amount and contained no tubercle bacilli. The general health declined slowly, and after some months the patient was removed to Davos. At this time infiltration of the right upper lobe and cavity-formation in the right lower lobe with pleural thickening were diagnosed, and the greenish yellow sputa contained actinomyces granules, but no tubercle bacilli. The patient's condition improved, and the evidences of consolidation and of excavation subsided, when she passed from observation.

Renon[4] reports 2 cases of pseudotuberculosis due to the aspergillus fumigatus. This occurred in a man and his wife who were engaged in combing and sorting hair. When the hair was moist rye-flour was used to dry it, and a good deal of dust was caused in the work. The wife was taken with hemoptysis after having worked for 7 years, and had the signs of an early tubercular lesion in the left lung. The husband was taken 9 years after he began the work with violent attacks of hemoptysis, and had signs of a cavity in the left lung with general bronchitis. In neither case did the sputum show tubercle bacilli, but there was much mycelium, and culture-experiments showed the aspergillus fumigatus. Of 6 pigeons subjected to inhalations of the dust of the room, 5 died promptly with lesions of aspergillus infection. The 6th recovered, but showed healed lesions at a subsequent autopsy. Renon thinks that millers and all other workers with grain are liable to contract the disease, and cites the aspergillar keratitis that occurs in millers.

[1] Mittheil. aus den Greizgebieten der Med. und Chir., Bd. 1, H. 1.
[2] Bull. de l'Acad. de Méd., Paris, Feb. 11, 1896.
[3] Berl. klin. Woch., No. 47, 1895.
[4] Compt. rend. de la Soc. de Biol., Nov. 1, 1895.

Schmidt [1] has reported 3 cases in which **protozoa** (Trichomonas) occurred in the sputum. The first was a case of aspiration-pneumonia following cancer of the larynx. There was slight bronchiectasis. The second was one of probable bronchiectasis in chronic pneumonia and pleurisy. The third was one of long standing bronchiectasis. Protozoa were found only in "Dittrich's plugs." Their size was that of a pus-corpuscle; they were oval in shape and granular. At one end 1 to 4 flagella in active motion were found, and extending back along the body was an undulating membrane. The body ended in a pointed tail. The author suggests the name *Trichomonas pulmonalis*, though he admits it may be the same species as that found in the vagina. The organism could not be cultivated.



FIG. 2.—*a*, large bacilli; *b*, spirilla; *c*, fat-drops; *d*, Trichomonas; *e*, pus-cells; *f*, different forms of Trichomonas; *g*, dying form (Münch. med. Woch., No. 51, 1895).

Pulmonary Neuroses.—Marcet [2] in his Croonian Lectures refers particularly to asthma in a clinical way. He points out that in coughing there is first a long breath, followed by the paroxysm of coughing, and this in turn by a deep breath to supply the blood with fresh oxygen after the forced expirations of the cough. Further, he points out that asphyxia occasionally produces spasms of the glottis, as in some cases of recovery from drowning, and expresses the belief that in some cases the momentary want of air produced by a bad fit of coughing may similarly be the cause of spasmodic asthma in persons subject to it. He refers to a physician subject to asthma who had a severe attack of wheezing and tightness of the chest after taking a cup of tea in the early morning. A succession of forced inspirations had the immediate effect of arresting both the wheezing and the tightness, and a second attack the same night was averted in a similar manner. He believes that asthma may be due to an excess of carbon dioxid in the body, and recalls the fact that the attacks set in with sudden cough, coming on in the evening or at night, and followed by spasm of the bronchial system. Subsequently the respiratory muscles become fatigued from overexertion at inspiration, and this further impediment prevents oxygen from reaching the centers of respiration. He therefore advocates measures to strengthen the respiratory muscles, and in particular recommends bicycle-riding. Regarding the latter, he cites the case of one person observed by himself in whom the paroxysms became much fewer, and finally almost ceased, after resort to this mode of exercise.

Strubing [3] reports a series of cases illustrating respiratory neuroses. In 2 cases there were attacks of slow and deep breathing, with subjective feeling of

[1] Münch. med. Woch., No. 51, 1895.
[2] Lancet, June 22, 1895, et seq.
[3] Zeit. für klin. Med., Bd. xxx. H. 1 and 2.

dyspnea and anxiety, and in 1 case orthopnea. The author terms this condition **spanopnea,** regarding it as an inhibitory neurosis. The cause in one case seemed to be irritation of the respiratory inhibitory fibers of the superior laryngeal nerve in swallowing; in the other it seemed to be an asthma from irritation of the trigeminal fibers in chronic rhinitis. He also reports 2 cases of tachypnea in which paroxysms of increased frequency and diminished depth of the respirations occur. One of these cases ceased after restoration of a retroflexed uterus. The other case was purely neurotic in character.

PLEURISY.

Aschoff[1] has studied 200 cases of serous pleurisy in Fränkel's ward to determine the **bacteriologic relations** of this affection. Cultures were made upon agar; fresh stained preparations were examined, and in 20 cases intraperitoneal inoculations were made in white mice; 43 of the 200 cases were found to be tuberculous by the discovery of tubercle bacilli in the sputum or other products; 19 others gave a tuberculous history. Direct bacterial examination gave positive results in only 7 of the 200 cases, and out of 17 inoculations only 2 belonging to the 7 cases with tuberculous history gave positive results. These were the cases of sepsis, and 1 of tuberculosis. The others were—metapneumonic 2, idiopathic 2, and 1 of each showing streptococci, and 1 pneumococci; 1, following gangrene of the lung, with streptococci. In the remaining 193 cases bacteriologic examinations were negative, and these the author divides into 2 groups, the first giving evidence of tuberculosis or a suspicion of this, and the second, so called idiopathic cases. Of 13 belonging to the first class, inoculations in guinea-pigs gave positive results in 7. Of inoculations in 12 suspected cases, 3 were negative. Among the so called idiopathic cases, 9 out of 12 caused tuberculosis in guinea-pigs. The author concludes that the view that most cases of idiopathic pleurisy are tuberculous is considerably strengthened by his observations; such cases may recover completely. He doubts whether rheumatic pleurisy ever occurs without affections of the joints or the heart, and in 16 cases in his series complication upon the part of the heart was invariably present. As regards the question of serous exudation and pathogenic bacteria, he concludes that such exudates are almost always free of bacteria, but if pyogenic organisms are present, suppuration is likely to occur, though in the case of pneumococci the early death of the organisms prevents the termination in suppuration.

Lefevre[2] has endeavored to determine the **etiology of pleural exudates,** and has been surprised at the rareness with which positive results were obtained in experiments made to determine the proportion of tubercular pleurisies. He found, however, in studying his cases, that many of them were preceded, accompanied, or followed by well marked rheumatic symptoms. Of 18 probably rheumatic pleurisies, 10 ran the course of simple fibrinous pleurisy without serous effusion; 3 were fibrinous at first, with subsequent effusion; and in 5 effusion existed from the commencement.

[1] Zeit. f. klin. Med., Bd. xxix. p. 440.

[2] Med. Rec., Feb. 8, 1896.

Charrin and Nobecourt[1] report a case of pleurisy developing in a woman 7½ months pregnant. The fluid withdrawn was purulent, and contained gas and a bacillus identical with the proteus vulgaris.

Levy[2] reports a case of **pneumothorax following pleurisy.** An anaerobic gas-producing bacillus was found in the exudate. At the autopsy there was no sign of perforation, the condition being one of spontaneous pneumothorax.

Faitout[3] contributes a collective paper regarding the **gonorrheal origin** of pleurisy. He finds a good number of reported cases, but only 1, that of Bordoni-Uffreduzzi, in which Mazza made the bacteriologic examinations, seems definitely established.

West[4] reports an interesting case of serous or albuminous expectoration after **paracentesis for pleural effusion.** The patient was a man of 40; he had had right-sided effusion for 3 or 4 weeks; 40 ounces of fluid were drawn with a siphon, when cough and distress occurred. Ten minutes later expectoration began, and in an hour 8 ounces were discharged. The attack lasted 3 hours, during which time a pint of frothy liquid was coughed up. Much wheezing and crepitation occurred in the chest, especially on the affected side. In studying the history of cases of this kind he found much difference in the different cases. The duration is usually not more than an hour or two, though extreme limits of 48 hours have been reported. The fluid varies from a few ounces to 3 pints, and contains much mucin and little albumin. The physical signs are those of congestion of the lungs. As a rule, serous expectoration occurs in cases in which the effusion is tapped late in the case. The result is rarely fatal, and among the fatal cases some complication was generally found. The only tenable explanation is that effusion is due to edema of the lung. In the discussion Hale White stated that he had recently seen a case in which the patient expectorated large quantities of liquid after aspiration. A striking feature was the fact that the condition lasted for several days.

Diagnosis.—Kellock[5] describes **a new physical sign** in pleural effusion. The observer stands at the left side of the patient and places the left hand flat and very firmly on the lower part of the thoracic wall just below the nipple, percusses sharply either with a finger of the right hand or with a plexímeter on the ribs of the same side, striking them just posterior to the angles. If no fluid be present, a very slight vibration of the rib which is struck posteriorly is felt by the left hand in front, or if there be fluid in the pleural cavity the vibration of the rib is much greater. If the quantity of fluid be considerable, the difference between the sensations experienced by the left hand when examining the sound or affected sides is most marked. He was able to obtain this sign even in cases in which the amount of liquid was small.

Pitres[6] calls attention to what has been designated a **plumb-line sign**

[1] Compt. rend. de la Soc. de Biol., June 21, 1895.
[2] Arch. für Exper. Path. und Pharmakol., Bd. xxxv. H. 4 und 5.
[3] Gaz. de Méd. de Paris, Oct. 5, 1895.
[4] Brit. Med. Jour., Apr. 18, 1896.
[5] Lancet, Mar. 28, 1896.
[6] Arch. clin. de Bordeaux, Feb., 1896.

(*signe du cordeaux*) of pleural effusion. The increased size of the chest on the affected side and the inspiratory position of the lower ribs cause a rotation of the sternum, the center of rotation being the top and the radius the entire length of the sternum. In consequence the plumb-line dropped from the middle of the sternum above would be from 2 to 4 cm. away from the sternum below. In measuring the size of the chest on each side with the cyrtometer the measure in front should be from this line, and not from the middle of the sternum. The fact that other conditions produce similar results make this sign comparatively of little value.

Bargebuehr[1] discusses **chylous exudates** into the serous cavities. He first reports a case in which there was secondary carcinomatous infiltration of the thoracic duct, following carcinoma of the stomach without chyloric effusion. He then reports 2 cases that he observed in which chyle or a chyliform liquid was found in the pleural cavity—1 a case of carcinoma of the peritoneum with metastasis to the liver, left lung, and pleura; 1 a case of carcinoma of the stomach with metastasis to the lymphatics of the lungs and to the liver. In the first case the liquid appeared to be of the nature described by Quincke as hydrops adiposus; in the second case the liquid contained sugar and was probably chyle. He now investigated the subject as presented in literature, and finds that altogether 41 cases have been recorded during a number of years. Some of these cases, however, are exceedingly doubtful, the absolutely certain cases being 5 in which there was a gross lesion of the lymphatic vessels; 1 in which filaria existed; 5 in which the liquid had been recognized by chemical analysis; 11 other cases may possibly be purely chylothorax. The remaining 11 cases may be included under the term hydrothorax chyliformis or adiposus. Regarding the diagnosis of the condition, it can be made only by the abstraction and analysis. There are no characteristic symptoms, either urinary or other. The prognosis is not favorable. Of 22 cases, 17 died; 4 were cured and 1 remained unimproved. The treatment is purely symptomatic, and paracentesis should be delayed as long as possible, because the pressure of the liquid tends to hinder the outflow of the chyle. In conclusion he calls attention to Hausenbrock's unique case of chylopericardium.

Hale White[2] contributes a report of **empyema** following lobar pneumonia. The report includes 26 cases of metapneumonic empyema that occurred within the last 10 years. The mortality was near 30%. Among the fatal cases were some in which general sepsis and malignant endocarditis occurred. Spontaneous cure occurred in 1 case by perforation through the lung; in all of the other cases operation alone effected a cure, mere aspiration being insufficient.

Pneumothorax.—Levy[3] reports an interesting case in which **gas** developed spontaneously **in a pleural exudate.** The patient, a man of 48, had been aspirated 5 times for a pleural exudate of serous character. A week after

[1] Deutsch. f. klin. Med., July 18, 1895.

[2] Guy's Hospital Reports, Lond., Perry and Jacobson, 1895.

[3] Arch. f. Exp. Path. und Pharmakol., xxxv., 1895, 4 und 5.

the last operation pneumothorax developed. Aspiration, and finally resection of a rib, were practised, but the patient died. At autopsy a caseous focus was found in the lung, and miliary tubercles on the peritoneum. There was no perforation of the pleura. Cultures made at the last operations showed the presence of a thick and immobile bacillus which caused abundant gas-formation, and was pathogenic for guinea-pigs. It is anaerobic, and corresponds to organisms found by the author in a parametric gas-abscess, and by Fränkel in several cases of gas-phlegmon.

Unverricht[1] considers the **treatment of tuberculous pneumothorax.** He recommends the establishment of the thoracic fistula large enough that air may enter freely and thus permit the pulmonary fistula to heal. The author applied this method in 2 cases within the last year, and found that it not only served to save life, but led to a repair of the pneumothorax. In 1 case recovery ensued after 14 days; in the other case the patient died, but there had been progressive diminution in the pneumothorax.

Intrathoracic Tumors.—Wolf[2] reports 31 cases of primary **carcinoma** of the lung occurring in over 7000 autopsies; 27 of the patients were men and 4 were women. The youngest was 36 and the oldest 70. The right lung was affected 5 times, the left lung 3 times, the right bronchus 13 times, the left bronchus 8 times, and both bronchi were involved twice. In 13 of these cases tuberculosis was a complicating condition. Metastasis was more likely to occur when the primary tumor affected the bronchi than when it affected the lung.

Ribbert[3] reports a case of carcinoma of the lungs that, besides spreading along the lymphatic channels, also entered the air-passages and spread along the surface of the alveoli until almost the entire lung was involved. He concludes that it is justifiable to believe that the carcinoma originated from the epithelium, and is to be considered as a primary tumor.

Pepper and Stengel[4] discuss the subject of intrathoracic tumors, particularly their clinical manifestations. Regarding the nature of the tumors, they first take exception to the statistics of Steinthal's and Hare's monographs, believing with Fagge and Powell that carcinoma is an exceedingly rare form. Of their own cases, 6 are sarcomata, 1 secondary cancer, and the other 2 probably sarcoma, although the specimens had been lost. Regarding locality, tumors of the anterior mediastinum are found to be three or four times as common as those of the posterior mediastinum. They usually arise from the remnant of the thymus, less commonly from the lymphatic glands. The tumors of the pleura, when primary, are usually endotheliomata, and of the lung carcinomata. Clinically the tumors are classified according to their situation in the posterior, middle, and anterior mediastinum. Of the first two divisions the subjective symptoms are of most importance, while tumors of the anterior mediastinum usually are easily recognized by the physical signs. An interesting case of this character is reported in which there was edema of the face and neck, considerable dyspnea, and at the autopsy a round cell sarcoma was found surrounding the base

[1] Centralbl. f. innere Med., Apr. 25, 1896.
[2] Fortschr. d. Med., Nos. 18 and 19, 1895.
[3] Deutsch. med. Woch., 1896, No. 11, p. 365.
[4] Internat. Med. Mag., Nov., 1895.

of all the large vessels and extending backward from the bronchi. The tumors of the middle and posterior mediastinum have, as their most decided symptom, dyspnea, which may increase to the highest degree of orthopnea. In some cases there is also dysphagia. Fever often occurs, particularly in growths of the posterior mediastinum. In regard to diagnosis the symptoms are usually extremely irregular, and resemble those of aneurysm, the most valuable distinction being the tendency on the part of intrathoracic tumors, particularly those of the anterior mediastinum, to cause early occlusion of the large veins, giving rise to enlargement of the superficial veins and other signs of venous engorgement. Tumors of the pleura are marked by more or less equally decided symptoms and physical signs.

DISEASES OF THE CIRCULATORY SYSTEM.

DISEASES OF THE PERICARDIUM.

Ewart[1] contributes a valuable article on **diagnosis of pericardial effusion.** Among the points are the following: extension of the lateral boundaries of the total area of dulness and great extension of the absolute dulness, the sternum being entirely dull; depression of the liver; dulness in the right fifth intercartilaginous space; and alteration of the lower angles of the triangle of cardiac dulness. The right angle, instead of projecting vertically downward or incurving toward the sternum, projects obliquely outward, and in this way furnishes a distinction from cardiac dilatation. The left angle is of importance, especially with regard to its position as related to the position of the apex-beat. Regarding the latter Ewart points out that the text-books are uniformly in error in alleging that the apex is elevated sometimes as high as the 3d rib by the accumulating effusion. The pulsation seen in this position is not the apex, but rather the base uncovered by the displacement of the lung. The author showed by preparing liquids of the specific gravity of the usual pericardial effusion that this could have no effect in the way of elevating the apex. Some slight upward displacement, he holds, may take place by the distention of the sac and the consequent upward dislocation of the bronchi, and with them of the pulmonary veins and heart; but this rise must be inconsiderable, and as a matter of fact he has found a descent of the apex. Further, he calls attention to the hyperresonance of the upper part of the chest due to relaxation of the lung and to the bulging of the left chest. A sign of considerable interest is that designated **"the first rib sign"** which he has found in all cases of considerable effusion. He finds that it is possible to feel with the finger the upper edge of the 1st rib as far outward as the sternum. The author thinks this especially connected with immobility and elevation of the lower ribs, coupled with great activity of the superior respiratory region of the chest. The left clavicle seemingly rises higher than is possible for the first rib. He has rarely seen this condition except in pericardial

[1] Brit. Med. Jour., Mar. 21, 1896.

effusion and some cases of considerable cardiac enlargement. The raising of the 1st rib is unlike that of emphysema, in which the rib and clavicle move together.

He calls attention to the patch of dulness immediately to the left of the spine and along the inferior margin of the ribs. Among the auscultatory signs is the occasional appearance of bronchial breathing below the right breast, which he regards as due to the active respiratory draught kept up by the movements of the upper lobe at the origin of the bronchi for the middle lobe, coupled with the consolidation of the latter in this situation. Posteriorly the breath-sounds are absent from the dull patch above described, and a rounded patch of tubular breathing has often been found below the angle of the scapula. Regarding the pulse, he states that he has frequently observed a large slapping pulse similar to the Corrigan pulse, though never so extreme. [Dr. Ewart's paper deserves careful study. He does not attempt to discuss systematically the well known signs of pericarditis, but rather adds certain novel ideas, and in this respect the paper is most suggestive.]

Broadbent [1] reports a **new sign of pericardial adhesions,** consisting of the visible retraction synchronous with the cardiac systole of the left back in the region of the 11th and 12th ribs. He reports 4 cases in which this sign was very marked, and in 3 of them it was present in a less degree also upon the right side. He believes that it is caused by a tug of the enlarged heart upon the central tendon of the diaphragm. In 3 of these cases there was also evidence of adhesion of the pericardium to the chest wall. In 1, however, the heart appeared to move freely beneath the ribs, and the area of cardiac dulness was diminished during inspiration, so that this constituted the only sign of pericardial adhesions.

DISEASES OF THE HEART.

Methods of Examination.—Gumprecht [2] advocates percussion of the heart with the patient leaning forward so as to bring the heart into close approximation with the anterior wall of the chest. In this position the boundaries of the normal heart are the left edge of the sternum, the 4th rib, and the left nipple line, or even beyond this. The width of the heart as compared with the circumference of the thorax is as 1 to 8. The advantage of the method is the greater ease of determining the outlines of the organ and the fact that emphysema and other conditions do not obscure the cardiac dulness. [We have used this method in a large number of cases, and have been able to convince ourselves of its value in a number of instances. In 1 case an aneurysm of the arch of the aorta was first detected in this manner.]

V. Basch [3] urges the more extensive use of the **sphygmomanometer** to determine the degree of arterial tension, and claims that even the most experienced clinicians differ or are uncertain in testing the pulse by the tactile method.

[1] Lancet, July 27, 1895.

[2] Deutsch. Arch. f. klin. Med., Bd. lvii. p. 490.

[3] Wien. med. Woch., No. 15, 1896.

Robertson[1] calls attention to a considerable imperfection in the Dudgeon and Marie **sphygmographs**; that is, the irregularity with which the paper is passed under the style. The motion is usually most rapid at first, and then diminishes rapidly. He recommends that each instrument be marked with the ascertained velocity of its movement. Tracings are given to show the effect of varying velocities upon the pulse-tracing. The instrument should always be freshly wound up before each application.

Andrew H. Smith[2] holds that the **value of the differential stethoscope** lies in its use for determining the time rather than the quality of sounds heard in different cardiac localities, particularly when there is a murmur at the apex and another at the base, both occurring in the same period. It is also useful in detecting slight degrees of reduplication of the ventricular systole.

Auscultatory Percussion.—Broadbent[3] criticises adversely a paper of Dr. Thorne on the Schott method of treatment, calling attention to the fact that the latter found the cardiac dulness as far to the right as the nipple-line at the upper limit of the cardiac dulness. He holds this to be irreconcilable with anatomic or clinical experience. He criticises still more unfavorably the bipartite outline found at the base of the heart and ascribed by Thorne to the presence of the auriculoventricular fibrous ring. Broadbent points out that this notch falls exactly in the position in which the aorta and pulmonary artery are situated. [While we must agree with Broadbent that his criticisms are justified so far as the facts are concerned, we cannot agree that auscultatory percussion is an unreliable method. We have ourselves practised this method in very many cases as a means to determine the cardiac outline, and while we have obtained no such results as Thorne's, we still have found it most useful in determining the size and shape of the organ.] Thorne,[4] in reply to Sir William Broadbent's objections to the method of auscultatory percussion, declares that it is quite possible to distinguish between the impairment of resonance caused by the subjacent heart and the vessels respectively, and that it is then possible to produce bipartite outlines of cardiac dulness; he also insists that the position of the auriculoventricular fibrous ring may be demonstrated by his method.

Acute Endocarditis.—[A number of cases have been observed during the year that suggest the possibility of the gonorrheal origin of this disease. Bacteriologists have shown that the gonococcus is capable of producing various metastatic lesions, and it seems practically certain that endocarditis may be one of the possible results.]

Winterberg[5] reports a case of acute endocarditis occurring during the course of an attack of specific urethritis which was complicated by right-sided epididymitis and enlargement of the glands in the groin. No improvement

[1] Edinb. Med. Jour., Mar., 1896.
[2] Med. Rec., July, 1895.
[3] Brit. Med. Jour., Mar. 28, 1896.
[4] Ibid., May 9, 1896.
[5] Festschrift zum 25. Jaehr. Jubilaeum des Vereins Deutscher Aerzte zu San Francisco, 1894.

occurred after the administration of sodium salicylate. At the autopsy numerous purulent foci were found in the myocardium, and the aortic and pulmonary leaflets were almost entirely destroyed, being represented only by fibrous, friable, caseous remains. Microscopic examination of the cardiac valves showed the presence of diplococci having the appearances of gonococci. [The absence of culture-experiments renders this case somewhat uncertain, but the following seems more definite.] Thayer and Blumer [1] report the case of a female of 34 who entered the hospital complaining of cough, weakness, and general pains. Her illness dated from an attack of rheumatism which occurred 3 months before, and in which most of the joints were affected, the disease passing rapidly from one joint to another. The day previous to the admission there was a chill. On examination enlargement of the heart with a presystolic and systolic murmur at the apex and an accentuated second sound at the pulmonary area were discovered. She lived 19 days, showing during this time irregular exacerbations of temperature, often attended with chills and marked emaciation. The spleen was palpable and there was considerable anemia. Acute ulcerative endocarditis of the mitral valve with infarcts in the lungs and spleen was discovered postmortem. Cultures from the blood during life on a mixture of blood and agar showed growths of the appearance of gonococci, and the organisms corresponded in their staining reactions (Gram's method) with gonococci. Cover-slip preparations made at the autopsy from the vagina, uterus, and vegetations on the mitral valve gave similar results, but cultures failed, and a mouse inoculated with a portion of the vegetation remained unaffected. [It seems likely that this case was one of true gonorrheal endocarditis.] Hale White reports a case that entered the hospital suffering from chill and hectic temperature. Subsequently a fine diastolic murmur was heard over the pulmonic cartilage, and later also a faint systolic murmur. All the symptoms of septicemia appeared, anemia grew profound, and there were attacks of uremic dysentery, in one of which the patient died. The only etiologic factor was an attack of gonorrhea contracted four weeks previously to admission. Examination of the blood for the gonococcus was fruitless. At the autopsy the pulmonary valve was found to be extensively affected with recent malignant endocarditis, and in the vegetations an organism resembling the gonococcus in appearance was found.

Zawadski and Bregman [2] report a case of acute endocarditis with embolism of the Sylvian artery which they regard as gonorrheal in origin. The case was a girl of 17 years who was admitted to the hospital with signs of cardiac disease, the heart being enlarged and the presystolic murmur being determined at the apex. Paresis and later paralysis of the right side were detected, and enlargement of the liver and spleen were determined. There was a mucopurulent vaginal secretion, and the mucous membrane of the cervix was reddened. The history showed that the patient had been exposed to infection, having become an inmate of a house of prostitution a month previously. Cultures made from the discharge discovered the staphylococcus pyogenes

[1] Arch. de Méd. expér., Nov., 1895.

[2] Wien. med. Woch., Feb. 15, 1896.

albus and micrococcus tetragenus. Gonococci could not be determined by the method of Turró. Subsequent bacteriologic examination showed the same microorganisms and also the streptococcus pyogenes. The patient suffered with hurried and irregular breathing, and died after 3 months' duration of the illness. There was marked irregularity of the temperature. The postmortem examination showed embolism of the Sylvian artery on the left side, with softening of the corpus striatum and part of the internal capsule; there were pleurisy, consolidation of the right lung, swelling of the spleen, and large white kidneys. Verrucose endocarditis of the mitral valves was discovered. Microscopic examination of the vegetations showed microorganisms corresponding to gonococci in their appearance and behavior to Gram's stain. Microscopic examination of the pleura was negative. No cultures were obtained.

Dauber and Borst [1] report a case occurring in a young man aged 20 years. Ten days before his admission to the hospital a purulent urethral discharge set in, and he came to the hospital on account of pain in the inguinal region. The urethral discharge contained diplococci corresponding to gonococci in their general characters. Fever developed, and after a month evidences of aortic valvular disease were obtained. The patient died 3 months after the onset of the gonorrhea. The postmortem examination was made 5 hours after death, and cultures were made with the blood and splenic pulp after the method of Král. The aortic valve was extensively diseased. Sections of the vegetations showed diplococci of biscuit-shape in and outside of the cells, and these were decolorized by Gram's method. Only 1 of the culture-tubes presented growths, and these were not of the character assumed by gonococci. The authors conclude that the endocardial disease was due to a microorganism resembling the gonococcus, but not identical. They regard the urethra or a small paraurethral abscess that existed in the case as the point from which infection occurred. [This case suggests the possibility that other instances of supposed gonorrheal endocarditis may have been caused by other microorganisms; but it is inconclusive. The organisms in the authors' case were not studied as thoroughly as could be desired. It is certain, however, that a diagnosis cannot be made from microscopic examinations alone. One of the editors (Stengel) reported a case before the College of Physicians of Philadelphia (the report has not yet been published), and held that the gonorrheal nature of his case could with some justification be assumed from the facts that micrococci corresponding in appearance and behavior to stains were found in the cardiac vegetations, and that cultures with ordinary media (agar, glycerin-agar) *failed* entirely. Suitable media for the cultivation of gonococci were not at hand.]

Caton [2] in a paper on the treatment of acute rheumatic endocarditis states that among 320 cases of **acute rheumatism,** endocarditis occurred in 20%, for the most part during the first 10 days of the disease, but sometimes not until defervescence or even a relapse had occurred.

Charrin [3] records a case of acute **endocarditis following tonsillitis.**

[1] Deutsch. Arch. f. klin. Med., Bd. lvi. H. 3 and 4.

[2] Lancet, Aug. 17, 1895.

[3] Semaine méd., Mar. 14, 1896.

The patient, a male of 18, had been at work up to within a few days before admission. When he entered the hospital his temperature was between 104° and 105° F. He had dyspnœa, patches of consolidation in the right lung, enlargement of the liver and spleen, albuminuria, and weak heart-sounds. The right tonsil was moderately swollen. A diagnosis of bronchopneumonia secondary to tonsillitis, the latter originating in influenza, was made. The patient died. Postmortem the condition of the lungs was found as expected, while exuberant vegetations were seen on the pulmonary valves. The staphylococcus aureus was found in the vegetations; the same organisms had been found swarming on the tonsils. The author believes this to have been the source of general infection.

Leyden[1] contributes an interesting contribution to the subject of **tuberculous endocarditis.** After discussing the relation of tuberculosis to diseases of the heart in general, he alludes to 4 cases in his own experience of acute endocarditis in which tubercle bacilli were discovered in the vegetations. In 1 of these cases the bacilli were also present in antemortem clots in the heart. He points out that acute endocarditis in tuberculosis is not due to the tubercle bacillus, and he also draws attention to the fact that in the cases in which the bacilli were found they were found in the cells of the vegetation. It is thus evident that the bacilli may be transferred to other parts and set up foci of tuberculosis.

Blumer and Young[2] report a case of **anthrax septicemia** in which acute endocarditis occurred.

Symptoms.—Dock[3] reports a case of malignant endocarditis developing 3 weeks after delivery, in which the fever was intermittent and was at first supposed to be malaria. Later a slight painless effusion occurred in the right knee joint. The heart-beat was regular and there was a marked systolic murmur, loudest over the apex, with several systolic murmurs along the edge of the sternum. There was a slight leukocytosis, but no parasites or pigment in the blood. The fever lasted about 49 days, and was for the most part intermittent, the rise of temperature usually occurring about noon and reaching its acme about 5 P. M. Sweating was almost always present during the decline. Large masses of vegetations were found on the aortic and mitral valves, which contained numerous streptococci in short chains. He further reports 2 cases that had occurred previously in his practice, in both of which intermittent fever was present, and recent vegetative endocarditis was found upon valves already diseased.

Treatment.—Caton[4] discusses the treatment of rheumatic endocarditis, consisting in the administration of **potassium** or **sodium iodid** in 10 gr. doses 3 times daily, in addition to **salicylates** and the application near the apex of a small **blister.** This treatment is begun as soon as the bruit is perceptible, or even prior to that, during the stage of "woolliness." When the the irritation of the first blister has subsided he applies a second, then a third,

[1] Deutsch. med. Woch., Jan. 9, 1896. [2] Bull. Johns Hopkins Hospital, 1895, Nos. 54, 55.
[3] Boston M. and S. Jour., Nov. 7, 1895. [4] Lancet, Aug. 17, 1895.

and so on; at the same time keeping the patient quiet, forbidding exposure or too much nitrogenous food. In defence of the value of the blister he states that it is likely that reflex influences operating through the nervous system are conveyed from the exterior to the organs and structures underlying the point of application. He calls attention to the fact that chilling of the thorax may cause bronchitis or pneumonia, and that a splash of cold water excites respirations in an infant or sets the action of the heart going during a faint. Further, he refers to his previous discussion before the Physiological Society at Oxford, in which he showed that stimulation of the surface-skin alters the caliber of the arterioles in the lung and causes variation in the electrical condition of thoracic and abdominal organs.

CHRONIC VALVULAR DISEASE.

Jackson[1] discusses the postmortem examination of 100 cases of cardiac disease. He finds that the lesion which most frequently escaped observation was the aortic disease combined with insufficiency of the mitral valve, 4 such cases having been overlooked; 3 cases of mitral stenosis and a curious case of acute ulceration of the pulmonic valves were also not recognized. The relative frequency of the various lesions was as follows: aortic and mitral valves, 17 cases; mitral valves, 13 cases; mitral, aortic, and tricuspid, 2 cases; aortic alone, 5 cases; and pulmonic, 1 case. In 26 cases of valvular disease in which the history was known 9 had had acute articular rheumatism. In 32 cases the disease of the heart was dependent upon arteriosclerosis. More than half of these cases were over 50 years of age. In those below this age alcohol was a marked factor. In 14 of the cases there was a structural disease of the kidneys. Rheumatism was commonly absent. 16 of the cases suffered from fatty or acute degeneration of the muscular substance; 2 cases of fatty degeneration occurred in pernicious anemia, and 1 each in phosphorus-poisoning and carcinomatous cachexia; 60% of the cases of heart-disease were dependent upon arteriosclerosis.

Pott[2] discusses the **etiology of heart-disease in children,** and bases his views on 95 cases which occurred among 30,000 children. Rheumatism and acute infectious fevers form by far the most frequent causes. A masked form of rheumatism in which fever, nasopharyngeal catarrh, enlarged cervical glands and spleen, herpes on the lips, and pains in the limbs occur is a frequent antecedent to heart-disease; 1 case of congenital heart-disease occurred in a child whose mother had rheumatism during pregnancy. Congenital syphilis was the probable cause in 3 cases.

Allyn[3] considers the relation of **heart-disease and pregnancy.** Mitral disease, particularly stenosis, is more serious than aortic trouble, but there is a natural attempt at prevention in the frequency of sterility among subjects having mitral stenosis. Cardiac disease frequently leads to abortion. Mixed lesions are more serious than simple ones.

[1] Boston M. and S. Jour., May 21, 1896. [2] Fortschr. der Med., Nov., 1895.
[3] Univ. Med. Mag., Dec., 1895.

Von Weismayr[1] reports 6 cases from the service of Professor Schrötter in which tuberculosis and valvular disease of the heart occurred coincidently. In 3 of these cases the tubercular process was evidently slow or chronic in its course, and from this fact, as well as from the small number of cases found in a large clinical service, he concludes that the old principle of Rokitansky still holds good, that the congestion resulting from a cardiac lesion makes the lung resistant to tuberculosis. He cites the statistics of Frommold, who found 21 cases among 226 of valvular disease, and of von Kryger, who found 10 cases of valvular disease in 1100 autopsies on tuberculous patients. [The coincidence of cardiac disease and tuberculosis of the lungs has not been unusual in our experience.]

General Symptomatology.—Gerhardt[2] reports a case marked by decided bigeminal pulse in which sphygmographic and cardiographic studies showed that the anacrotic pulse was due to the contraction of the auricle. The case was one of aortic insufficiency with mitral stenosis and marked hypertrophy and dilatation of the auricles. In another case of aortic insufficiency a double pulse was palpable, but this was due to a decidedly elastic wave, probably dependent upon sudden tension of the vessel wall.

Stockton[3] describes as a symptom of cardiac insufficiency severe pain localized in the lumbar region, somewhat resembling the aching observed in those suffering from uric acid sand. It is promptly relieved by correcting the circulatory disturbances, but not by other methods of treatment. The majority of cases occur in men engaged in laborious outdoor work.

Fuller and Gibbs[4] reports the case of a girl of 15 in whom there was a cardiac murmur so loud that it could be heard at a distance of 12 feet from the patient fully dressed, or 3 feet outside a closed door, the patient being the same distance on the other side of the door with the chest exposed. The murmur varied in intensity at different times and seemed to be mitral. The only symptom was a slight breathlessness upon exertion. [We have ourselves seen a number of cases in which cardiac murmurs have been audible at a distance. The most striking was an instance of aortic aneurysm just above the valves, in which a loud to-and-fro murmur was plainly audible from 6 to 8 feet from the patient. A most interesting case occurred in the practice of Dr. Wm. Gerhard and Dr. Wm. Pepper the elder, in which a buzzing murmur afterward found to be due to a partially detached valve was audible throughout the patient's house.]

Phear[5] contributes an interesting paper upon **presystolic murmurs** heard at the apex **without mitral stenosis.** He first records 2 instances in which such a murmur existed and in which the aortic valves were entirely competent. In 1 of these the pericardium was adherent; in the other this structure was healthy. After considering the theories advanced in explanation of presystolic murmurs at the apex independent of mitral stenosis, he con-

[1] Wien. klin. Woch., Feb., 20–27, 1896.
[2] Zeit. f. klin. Med., Bd. xxix. p. 324.
[3] Brit. Med. Jour., 1895.
[4] Lancet, Apr. 4, 1896.
[5] Ibid., Sept. 21, 1895.

cludes that 2 factors are important: 1. Contraction of the chordæ tendineæ; 2. Dilatation of the left ventricle. Each of these factors is operative by stretching the mitral segments in a longitudinal direction, and thus bringing them more closely together than normal. In a certain sense this constitutes mitral stenosis, though the valves themselves are healthy. The author concludes his paper by brief abstracts of previously recorded cases, tabulating them in the following groups: 1. Cases with aortic regurgitation; 2. Cases with entire or partial adhesions of the pericardium; 3. Cases in which neither aortic regurgitation nor pericardial adhesions were discovered. The entire series includes 46 cases, in 17 of which the aortic valves were incompetent, and in 20 of which the pericardium was adherent. In 12 instances a presystolic or diastolic thrill was present. In 7 cases only the condition of the chordæ tendineæ was mentioned, being healthy in 3, thickened without shortening in 2, and shortened in the remaining 2.

Starling[1] states that he believes that **dropsy** is caused by the separate or combined action of 2 factors: 1. Increased exudation; 2. Diminished absorption by the lymph channels. The endothelial cells of the vessels, however, take no active part in the production of the exudate, their vital activities being confined to the maintenance of their integrity as a filtering membrane, with properties differing according to the part of the body in which they happen to be situated. The amount and composition of the lymph transuded in any part are determined solely by 2 factors: 1. The permeability of the vessel wall; 2. By the intracapillary blood-pressure. He has performed careful experiments to test whether exudation of lymph was in any way subject to the control of the nervous system, but he concludes that this is never the case, and when as a result of some nervous influence exudation takes place, it is simply due to a rise of capillary pressure, and is therefore only a secondary effect of the interference with the nerve. Even when there is increased transudation it is possible for the normal mechanism to hold this process in check by absorption for some time.

Davidson[2] has investigated very carefully the **cause of cardiac murmurs.** He reports a series of experiments which seem to show that the murmurs are due to the impingement of a stream of liquid obliquely upon a thin membrane. And he recites the physical law that when a membrane enclosing a liquid receives on its internal surface a stream that impinges against it at any angle whatever, it will be thrown into sonorous vibrations. These vibrations give rise to a sound when the stream impinges with rapidity and force, the pitch of the sound depending upon the relative thinness of the membrane (the thinner the membrane the higher the pitch), and the intensity upon the force with which the stream is emitted. A murmur is produced if the force is slight. Thus in aortic stenosis the left ventricle empties itself slowly, and the valves obstructing the outflow act as a membrane against which the stream impinges, giving rise to a murmur. In aortic insufficiency, on the other hand, recoil of the aortic wall produces a stream of liquid which regurgi-

[1] Lancet, May 9, 1896.

[2] Ibid., June 15, 1895.

tates into the ventricle, impinging against the aortic surface of the semilunar valves. If, however, the semilunar valves be completely removed, the murmurs will still be produced. This he has shown to be due to the impingement of the stream against the wall of the ventricle, thus proving that a muscular membrane enclosing a liquid can be thrown into sonorous vibration. He next undertakes to explain the cause of the first sound at the mitral orifice: this he believes to be due to the sudden striking of the blood against the ventricular surface of the mitral leaflets at the end of auricular contraction. The stream strikes the valves with great force, causing them to vibrate and giving rise to a sound. If, however, for any reason whatever, the rapidity of the stream be slowed, a murmur will be produced, and this accounts for the functional murmurs produced by a state of generally bad nutrition, as in chlorosis and the fevers, which are due to the weakened condition of the auricular muscle and the consequent slowing of its contraction. In mitral stenosis the murmur is rough in character, because the hypertrophied auricle contracts with considerable force and drives the column of liquid against the auricular surface of the mitral leaflets. In mitral regurgitation it might be supposed that the stream is sufficiently vigorous, providing there be no aortic stenosis to give rise to a sound; it must be remembered, however, that the period during which the stream acts upon the ventricular surface of the mitral leaflets occupies the whole period of ventricular contraction and is therefore considerably prolonged, and is thus able to give rise to a murmur. In conclusion, Davidson suggests a new nomenclature for the cardiac sounds, calling the first sound the auricular and the second the ventricular. He claims that arterial murmurs may be explained by the same acoustic principles. Thus if the stethoscope is pressed against an artery, its wall is forced inward, opposing a membrane to the current of blood. Geigel[1] has concluded that it is impossible that cardiac murmurs can be due to eddies, since even the lowest note requires at least 200 vibrations per second. He therefore thinks that the theory of lateral vibrations in the walls or valves due to the friction of the blood is the only rational one.

Mitral Stenosis.—Gouget[2] reports an interesting case of mitral stenosis and regurgitation occurring in a young woman of 34 who had suffered with rheumatism. She passed through 3 pregnancies without notable symptoms. Finally, signs of failure of compensation developed and she entered the hospital. At first there were discovered evidences of enlargement of the heart and of mitral stenosis, with a faint murmur at the apex that appeared systolic. The interesting feature, however, was the fact that the right radial pulse was scarcely palpable. The brachial, axillary, and subclavian pulses on the right side gave similar results. On the other hand, the left radial, brachial, and subclavian were easily palpable. The carotid pulse was perceptible on both sides, but more on the right than the left. Jugular pulsation was marked. Subsequently the conditions noted continued, but the signs of a double lesion at the mitral valve became very pronounced, and a systolic murmur developed over the second left interspace, being rather localized and having a soft charac-

[1] Virchow's Archiv, Bd. 140, Heft 2, S. 385. [2] Rev. méd., Sept. 10, 1895.

ter resembling the murmur of aortic insufficiency. The patient died, and at autopsy the heart was found enlarged, the mitral orifice was extremely contracted, and the pulmonary leaflets were incompetent (hydrostatic test). The author calls attention to 2 interesting features in the case: the occurrence of a murmur of pulmonary insufficiency, and the extreme feebleness and almost impalpable character of the right pulse. The pulmonary insufficiency is doubtless due, as he suggests, to over-distention of the pulmonary vessels and consequent enlargement of the orifice. The existence of such a murmur has been denied, but the case of Pawinski, as well as the present one, are undoubted instances. The disappearance and the reappearance of the murmur under treatment is interesting. The weakness of the right pulse is doubtless due, as was suggested by Popoff several years ago in a similar case, to pressure upon the arteries by the distended auricles or veins. In case of competence of the tricuspid valve the over-distention of the left auricle and pulmonary veins may compress the vessels of the left side, causing a weakness of the radial pulse on that side. When the tricuspid valve has become incompetent, over-distention of the venous trunks entering the right auricle may compress the innominate artery and its branches, and thus occasion weakness of the right pulse. This explanation is doubtless applicable in the present case.

Griffith[1] calls attention to the fact that nearly all text-books state that the murmur of mitral stenosis is practically limited to the region of the apex, though his own experience would show this view to be an incorrect one. Among 7 cases examined during the previous 3 months, he found 3 in which the murmur was audible in the back, 1 in which it extended 2½ in. beyond the left posterior axillary line, 4 in which it reached this line, and 2 in which it extended as far as the mid-axillary line. In each of the cases it was audible very high in the axilla. The case-histories are recorded, and diagrams of the chest, showing the distribution of the murmurs, indicate very clearly the degree of transmission of the sounds in these cases.

Heitler[2] refers to **pseudodiastolic murmurs** causing a mistaken diagnosis of mitral stenosis. He refers to a case in which a systolic mitral murmur was heard at the apex, followed after a short interval by a short diastolic murmur. Both murmurs were localized to the apex. The diastolic murmur, however, did not have the qualities of the murmur of mitral stenosis, and on careful examination it was noted that it mimicked the systolic murmur exactly, though it was much less distinct. Careful palpation of the carotid pulse showed that stronger beats alternated with weaker beats, and that the weaker murmur corresponded to the latter. Later the heart's action became more regular, the bigeminal character of the pulse ceased, and a systolic murmur alone was heard with each cardiac contraction and of constantly equal intensity.

Mitral Regurgitation.—Cantani reports a case of mitral regurgitation in which dilatation of the right heart commenced and marked insufficiency occurred. As death appeared imminent, it was resolved to perform **cardiocentesis,** and a puncture was made in the 6th interspace 1 in. from the

[1] Am. Jour. Med. Sci., Sept., 1895.

[2] Wien. med. Woch., Jan. 4, 1896.

sternum. A stream of bright scarlet blood spurted from the trocar, and in 5 days the man's cardiac symptoms had been completely relieved. He subsequently died of pulmonary phthisis, and at the autopsy it was found that the trocar had entered the left ventricle. Cantani expresses surprise that puncture of the left ventricle should have produced such efficient relief in this instance.

Heitler[1] records a case of mitral regurgitation in which the murmur was heard over the base of the heart.

Aortic Regurgitation.—Edwards[2] reports a case in which there was great dilatation of the heart and a soft blowing murmur, replacing the second sound at the aortic cartilage. At the autopsy the aortic and pulmonary valves were found competent by the hydrostatic test, and the valves were perfectly normal, and there were no thickenings, no adhesions, and no deformity. There was an uncomplicated hypertrophy of the left ventricle, and an incision showed numerous fibrous cicatrices between the muscle fibers, the larger part being found in the lower half near the apex. He concludes that there existed during life a relative aortic regurgitation, due, first, to dilatation of the aorta itself, and, secondly, to a dilatation of the left ventricle. Although the murmur of relative aortic insufficiency has been described as uncommonly loud, musical, and audible at some distance, in this case it was soft and blowing, exactly similar to the normal murmur of aortic regurgitation, so that the character of the bruit is of itself no guide in aiding the diagnosis.

Pulmonary Stenosis.—Hanot[3] records 3 cases of pulmonary stenosis, in all of which there was a strong tubercular family history; in 2 of the cases both the mother and father died of phthisis; 2 of these cases had shown signs of scrofula in childhood, but neither of them now present any respiratory disturbances. Hanot discusses the possibility of this form of stenosis being similar to the congenital narrowing of the aorta, such as occurs in chlorosis, and whether both are not manifestations of heteromorphous tubercular heredity. He believes it legitimate to suppose that in certain cases this narrowness of the pulmonary artery itself absorbed the whole or the greater part of the tubercular tendency, and therefore to a certain extent occasioned immunity against phthisis. [The frequent association of pulmonary stenosis and tuberculosis of the lungs is well established, but we question the justification of such a theory as that of Hanot just referred to.]

Adams[4] reports a case of sudden death in a boy of 14 who, aside from slight dyspnea on exertion, was apparently perfectly healthy. At the autopsy the right ventricle was found enormously hypertrophied and dilated, with adhesions between the pulmonary leaflets, leaving an opening scarcely ¼ in. in diameter.

Aufrecht[5] contributes an interesting article on **alcoholic myocarditis.** In the first stages the heart is found enlarged, and the sounds are clear or at

[1] Wien. med. Woch., Jan. 4, 1896. [2] Am. Jour. Med. Sci., Oct., 1895.
[3] Gaz. Hebdom. de Méd. et de Chir., Mar. 19, 1896.
[4] Boston M. and S. Jour., Jan. 30, 1896. [5] Deutsch. f. Arch. klin. Med., Bd. liv. H. 6.

most there is a low systolic bruit. The symptoms disappear after a time. In the later stages advanced cardiac failure with ascites, anasarca, enlargement of the liver, and not rarely albuminuria, occur. Dilatation and hypertrophy of the heart are invariably present. The author states that the condition referred to is the same as that described by Bollinger as idiopathic hypertrophy and dilatation of the heart. The latter author described it as rather acute, but Aufrecht holds that it extends from 3 to 5 years, and cites 3 cases which came under his observation. It is a disease of the better classes and is quite general in distribution. Alcohol in any form may bring it about, and men between 25 and 50 are more commonly affected. The first symptom is shortness of breath or pressure in the region of the heart. The heart is found enlarged, due to dilatation which precedes hypertrophy. This primary dilatation Aufrecht holds to be due to alcoholic weakening of the muscles. It is difficult to distinguish from chronic nephritis with its consequences, and from fatty heart.

Laache[1] in an elaborate article on the **nonvalvular affections of the heart** refers particularly to the so-called idiopathic hypertrophy and the degenerations of the cardiac muscle. He points out that the morbid changes in the myocardium may be of various kinds, and states that according to his view the "idiopathic hypertrophy" of the Germans is not a special disease, but rather a group comprising different affections. In the discussion of the etiology particular stress is laid upon alcohol. Over-exercise of the heart is an important factor, but he warns against the assumption that this is the all important cause, in view of the fact that many cases show other causes at the same time. As far as his own experiences in Norway are concerned, he refers to the exercise of the "ski" as a frequent cause of disturbances which are explainable as a result of cardiac weakness, and refers to the expression "*at sprange sig*" as a popular indication of the role played by distention of the heart in these accidents. In certain cases he admits it is impossible to find causes, and in these it is permissible to apply the term idiopathic. The symptomatology and the treatment are elaborately discussed, and extensive references are made throughout to the literature.

Rieder[2] discusses much the same subject, and in particular hypertrophy of the heart due to overexercise. He reports 3 cases which were carefully observed for a long time. The first affected a student aged 24; the other 2 cases occurred in laboring men, aged respectively 27 and 19. In the first case overexertion was acute and occurred in mountain-climbing; in the second and third cases the strain was more gradual and occurred in the ordinary daily occupation of the patients. While it is certain that a perfectly healthy heart may suffer from over-exertion, there was reason, in the 3 cases reported, to believe that preexisting disease aided in the subsequent dilatation and hypertrophy. In the first case there was a history of excessive consumption of beer (10 to 12 liters a day). In each of the cases the symptoms of disturbed cardiac action were distinct and the signs of hypertrophy and dilatation evident. The first recovered, and the dilatation (possibly hypertrophy also) subsided, and the

[1] Rev. méd., Sept. 10, 1895.

[2] Deutsch. Arch. f. klin. Med., Mar. 13, 1896.

patient subsequently gave no evidence on physical examination of a preexisting disease. In regard to treatment the beneficial action of calomel was noted in cases 1 and 2, and of digitalis in cases 2 and 3. The description of the cases is followed by a systematic discussion of the entire subject of idiopathic diseases of the heart.

Fisher[1] finds among the records of the hospital during 10 years 22 cases of hypertrophy of the heart without gross organic lesion; 8 of these cases were alcoholics, 3 had suffered from over-exertion, and 3 had atheroma of the peripheral arteries. The remaining 8 cases were of doubtful origin. The clinical features of these cases differed little from those of organic disease of the heart. Signs of failing compensation occurred frequently, and systolic murmurs could be heard at the apex or on the right side. Anginoid attacks sometimes occurred in the earlier stages. It is striking that cirrhosis of the liver scarcely ever occurred in the alcoholics.

Edwards[2] reports a case of **chronic fibrous myocarditis** in which the signs of aortic regurgitation were pronounced, though the autopsy showed that the valves were entirely normal. The patient, a negro laborer of 54, had been an excessive drinker, and had suffered with rheumatism for 9 months. The cardiac symptoms began 4 years before admission. When he came under the author's notice the heart was greatly enlarged; there was a diastolic murmur and pulsation of the vessels, Traube's sound, and other evidences of pure aortic regurgitation. The patient grew worse and died. At the autopsy marked atheroma of the coronary arteries and advanced myocarditis were discovered, but the valves were normal and were competent to the hydrostatic test. The author concludes that this was an instance of functional or relative insufficiency, and reviews the literature of this subject. He has been unable to find more than 25 cases of this character, and some of these are reported twice. The review of the literature leads him to conclude that, despite the view of eminent authorities, relative aortic insufficiency does occur, either from dilatation of the aorta in consequence of atheroma, senile involution, aneurysm, acute aortitis, or from dilatation of the left ventricle resulting from over-exertion, arteriosclerosis, aortic disease, synechia cordis, increase of arterial tension, parietal endocarditis, nephritis, fibrous myocarditis, or idiopathic dilatation. [The author states that "American authors do not mention its existence." This statement, however, is not entirely accurate. We have ourselves observed several instances of relative aortic insufficiency due to aneurysm and arteriosclerosis, and have recently met with a striking case of the same condition resulting from dilatation of the left ventricle in a case of pernicious anemia. Moreover, one of the editors has noted the occurrence of this condition in a systematic discussion of disease of the heart and vessels published several years since.[3]]

Radasewsky[4] believes that the cardiac arhythmia of chronic myocarditis

[1] Guy's Hosp. Rep., Lond., Perry and Jacobson, 1895. [2] Am. Jour. Med. Sci., Oct., 1895.
[3] Am. Text-Book of the Theory and Practice of Medicine, vol. ii. pp. 291 and 418.
[4] Zeit. f. klin. Med., Bd. xxii. p. 381.

is really due to degeneration of the walls of the auricles. He examined the hearts of 6 cases, in 2 of which the cardiac action had been regular, and in these the walls of the auricles were intact; whereas in the other 4 in which arrhythmia had existed they were considerably diseased.

Treatment of Cardiac Diseases.—[Considerable attention has been given in the last few years to the method of treatment pursued at Nauheim under Schott. Undoubtedly graduated gymnastic exercise and warm bathing are useful measures of treatment in suitable cases, but certain very proper criticisms may be offered when a routine plan is adopted for all cases and adequate discrimination is neglected. Besides this, it may be remarked that little reliance can be placed in the statistics published to show the general usefulness of the method.]

Saundby[1] describes the **Nauheim or Schott treatment** of heart-disease, consisting of warm saline baths and exercise. The effect of both is to increase the force and the rate of the pulse and to contract the area of cardiac dulness. Sphygmographic tracings showed that the rate of the pulse and its force are increased during the movements and immediately afterward. Saundby has himself tried the treatment in several cases. In 1 case of exophthalmic goiter the result was doubtful, but the patient claimed to feel improvement; 2 cases of chronic mitral disease were improved, 1 was made worse, and 1 is still under treatment. Saundby, in opposition to Schott, believes that the primary effect of baths and exercise is on the peripheral circulation, but that their action is to raise the blood-pressure, the heart becoming slower in accordance with Marie's law. The benefit to the system is due to the careful and easily regulated method by which the extra work is imposed upon the muscular wall. He concludes by the suggestion that there is a large group of cases suitable for application of this treatment in private practice, among others, cases of weakened heart occurring after acute disease, such as rheumatism, influenza, etc.

Leith[2] has studied very carefully the physiologic effects of bathing as given according to the Schott system at Nauheim, his results agreeing with those of other investigators. He found that the **resisted gymnastics** seemed to have an appreciable influence upon the area of cardiac dulness; but trivial actions—that is, a few minutes of gentle exercise or even a change of posture —had also an appreciable influence. Thorne[3] in advocating the Schott method of treatment for cardiac diseases calls attention to the changes discoverable in the size of the heart and in circulation during this treatment. There is immediate evidence of dilatation of the peripheral blood-vessels and diminution in the size of the heart. This results from the direct effect of the warm baths upon the distribution of the blood. In determining the size of the heart he uses the method of auscultatory percussion. Broadbent[4] in his criticism of Dr. Thorne's contribution upon the Schott treatment of cardiac diseases makes the following timely remarks upon this method: "The Schott

[1] Brit. Med. Jour., Nov. 2, 1895.
[2] Edinb. Med. Jour., Mar., 1896.
[3] Brit. Med. Jour., Mar. 14, 1896.
[4] Ibid., Mar. 28, 1896.

method has undoubtedly potentialities of usefulness in certain forms of heart-disease, and it is a matter of great interest and importance to ascertain with some degree of certainty and precision in what class of cases it is of most service. No advance can be made in this direction while it is employed indiscriminately in all forms and stages of heart-disease, including cases in which perfect compensation has been obtained and cases in which no real heart-affection exists, nor while statements are made which seem to imply that it is equally efficacious under all circumstances. It must be borne in mind, too, that any treatment which is powerful for good can also when misapplied do harm; grave risk, for instance, is incurred when the Schott methods are practised in cases of aneurysm. Herschell[1] also questions the value of the Nauheim treatment of cardiac disease, and records 4 cases in which he has employed warm baths without beneficial effect and perhaps with positive detriment. As far as the reported benefits are concerned he believes that many cases supposed to have been benefited or cured are instances in which the patient had suspected cardiac disease, but in which it had not existed. Other cases he believes are instances in which compensation was not disturbed or in which gross errors of diet and of daily hygiene had existed which were temporarily corrected. Finally, he refers to the case of a man who had undertaken the treatment at the advice of friends, with the result that his compensation, previously good, was broken and death ensued.

Ennesbuske[2] describes the **various forms of gymnastics** that have been employed in the treatment of cardiac conditions. He groups them under 3 heads: The manual gymnastic method of Ling; the medico-mechanic method of Zander; and the mountain-climbing method of Oertel. The conditions treated are valvular diseases, fatty heart, weak heart, and uncomplicated hypertrophy. The indications are to increase the force of the systolic stroke and to relieve venous hyperemia and hydropic exudations. The treatment should usually consist at first of manipulations and passive movements; later very mild active movements may be permitted. He reports several cases of mitral incompetency with symptoms of mild degree in which he was enabled by gymnastic movements to reduce the heart-rate on an average of 10 to 15 beats per minute after an hour's gymnastics, with more or less permanent improvement in the general condition.

Zabludowski[3] advocates massage—that is, the passive movements—in cases of heart-disease. He believes that the movements should not be carried out in too delicate a manner, but practised energetically for about 10 or 15 minutes every day, preferably in the morning. He reports 3 cases, 1 of nervous palpitation, 1 of cardiac insufficiency, and 1 of commencing aortic insufficiency, all of which were greatly improved by this treatment. He has also used it with good effect in Grave's disease.

Högerstedt[4] contributes a monograph upon the effect of circulatory dis-

[1] Lancet, Feb. 15, 1896.
[2] Boston M. and S. Jour., June 18, 1896.
[3] Berl. klin. Woch., May 26, 1896.
[4] Ueber chronische cirkulationstörungen, etc., St. Petersburg, Wienecke, 1895.

turbances upon the blood-pressure and the influence of warm baths. He finds quite a constant increase in the blood-pressure of the arteries, the general circulation in attacks of palpitation, and other disturbances of the cardiac action. No relation can be drawn between the blood-pressure and the presence or absence or the amount of peripheral venous engorgement. Warm baths (30° R.) cause a lowering of the blood-pressure temporarily, and exercise a happy effect in the gradual restoration of normal conditions of the circulation.

McColl[1] relates his personal experience regarding the **effect of altitude** upon cardiac disease. He has suffered for 25 years with attacks of acute rheumatism (9 in all), and has diseased mitral valves with fair compensation. On several occasions during visits to places having an elevation of 5000 to 10,000 feet he has experienced great comfort, the cardiac fatigue, depression, and the sense of emptiness at the top of his head disappearing almost at once.

Medicinal Treatment.—Balfour[2] in a paper on the digitalis-group in the treatment of heart-disease, states that **strophanthus** is a valuable member of this group. It has no pretensions to rival digitalis, being so much less certain in action, and so devoid of tonic properties that he is not tempted to displace digitalis in its favor. Strophanthin has two advantages over digitalin: it is readily soluble in water, and is rapidly absorbed. Regarding the applicability of digitalis, he says it may be beneficially employed in all cases, whatever may be the cause or nature of the concomitant lesions. Even when compensation appears well established no harm can result from giving tonic doses of the remedy. He does not agree that its action is generally bad in aortic regurgitation, and he has never seen damage accrue from its use in feeble and dilated hearts, so commonly regarded as fatty. The most suitable preparations are the fresh leaves, the infusion ranks next, and the tincture last.

Vatin[3] has investigated the action of **digitoxin** in cardiac diseases. He finds that it produces slowing and regularity of the pulse, improvement in respiration, and diuresis. Occasionally there was nausea and vomiting after its administration. It is indicated particularly in cardiac insufficiency; it is contraindicated in venous stasis with secondary changes and in gastric disturbances.

Morrison[4] in considering the **treatment of aortic valvular diseases** maintains that the circulation is not alone dependent upon the propulsion caused by the contractions of the ventricle, but ascribes it partly to aspiration of the left ventricle itself and to that exercised by the chest-cavity during inspiration. He holds that in aortic regurgitation digitalis is comparatively useless, as the indications call for remedies which will quicken circulation, such as belladonna, strychnin, and nitrites. Digitalis and its congeners are specially useful in mitral regurgitation, in which maximum aspiration is required.

Askanazy[5] has carefully studied the clinical action of **diuretin,** and concludes that it is a reliable diuretic in disease of the heart and vessels, but less

[1] The Physician and Surgeon, Aug., 1895.
[2] Brit. Med. Jour., Dec. 14, 1895.
[3] Gaz. Hebdom. de Méd. et de Chir., Apr. 5, 1896.
[4] Brit. Med. Jour., Mar. 14, 1896.
[5] Deutsch. Arch. f. klin. Med., Dec. 13, 1896.

valuable in chronic nephritis. It acts promptly and very uniformly against attacks of cardiac asthma, angina pectoris, or conditions of chronic cardiac dyspnea such as occur in aortic insufficiency and chronic nephritis. If as much as 5 or 7 grams a day are given, severe collapse occasionally occurs, and he therefore recommends a maximal dose of not more than 4 grams. [We have found the drug most useful in some cases, but it occasionally produces severe headaches and gastric disturbances.]

Huchard[1] considers **theobromin** one of the best and most uniformly reliable drugs for the treatment of anasarca and edema accompanying renal and cardiac diseases, and states that it acts directly upon the renal epithelium.

Murray[2] speaks of the extreme value of **mercury** in certain forms of heart-disease, and reports the case of a Scotchman who suffered from extreme cardiac insufficiency, and in whom none of the ordinary stimulants were of any benefit; he was immediately improved, however, by large doses of blue pill, and continued using the drug for ten years, living for that time in comparative comfort and working hard. At the postmortem the heart was found to be enormously increased in size, the tricuspid orifice admitted 8 fingers, and there was extreme constriction of the mitral orifice.

DISEASES OF THE MYOCARDIUM.

Pässler and Romberg[3] discuss the causes of **disturbances of the circulation in infectious fevers.** Romberg with Bruhns and Pässler previously showed that in cases of pneumococcus and pyocyaneus infections central paralysis of the vasomotor system, and not cardiac weakness, caused disturbance of the circulation. The present investigations were made with diphtheria, and a similar result was obtained. They found the heart-action slowed and somewhat irregular, and the fall of blood-pressure due to the paralysis of the vasomotor center in the medulla. Romberg[4] believes that it is possible to discriminate between weakness of the cardiac muscle and vasomotor paresis by the fact that in the latter case abdominal massage causes increase in the blood-pressure.

Chronic Myocarditis.—[The importance of chronic diseases of the myocardium has never been properly appreciated, despite the important contributions of older writers. At the present time there is, fortunately, a tendency to investigate the muscular defects of the heart, and a more general knowledge of their importance as independent affections and as concomitant conditions in chronic valvular disease is observable. We have ourselves studied with much interest cases of myocardiac degeneration leading to pronounced failure of circulation, and have been particularly impressed by the abundance of such cases in the wards of the Philadelphia Hospital. The character of many of the patients of that institution is a sufficient indication of the probable causes: exposure, hard labor, alcoholism, and syphilis.]

[1] Rev. de Thérap., Feb. 1, 1896.
[2] Lancet, Sept. 28, 1895.
[3] Centralbl. f. innere Med., Apr. 25, 1896; Berl. klin. Woch., Apr. 20 and 27, 1896.
[4] Centralbl. f. innere Med., 1895, No. 40.

Cardiac Neuroses.—Kisch[1] in a paper upon the cardiac disturbances that are likely to occur at the time of the establishment of the menstrual functions concludes that **nervous palpitations** and **paroxysmal tachycardia** are met with in a considerable number of cases, that the cardiac disturbances of chlorotic girls are dependent upon the establishment of menstruation, and that hypertrophy of the heart occurs in consequence of the circulatory disturbances incident to this time of life, as well as in consequence of the rapid growth and improper clothing of this period.

Sharpless[2] reports a case of miliary tuberculosis remarkable for the extraordinary **arrhythmia** of the heart. At various times the pulse in the course of a few beats would drop from the rate of over 100 to one less than 70. No causes could be discovered to account for this peculiar action.

English[3] reports a very extraordinary condition of the heart characterized by arrhythmia, dyspnea, palpitation, sighing, respiration, etc., which he believes was due to indulgence in **tomatoes.**

Morrison[4] reports 37 cases of **bradycardia.** Of these, 1 was under 20 years of age; 2 between 20 and 30; 2 between 30 and 40; 7 between 40 and 50; 6 between 50 and 60; 10 between 60 and 70; 7 between 70 and 80; and 1 between 80 and 90; 31 of the patients were males, a proportion which agrees with results obtained by Grob, who found 131 cases in males and 9 in females. The common cause of the cases occurring under 40 years seems to have been excessive muscular strain. Syphilis is also recorded in 2 cases. He believes that, as recovery sometimes occurs, a heart healthy as to its muscles may become acutely dilated. Another local cause is the actual stenosis at the aortic orifice due to changes of the aortic cusps (or a virtual stenosis due to dilatation of the left ventricle). Another condition having the effect of slowing the heart's action is the increase of the resistance of the vascular system which comes with age. The impediment to the thoracic or abdominal respiratory action, such as occurs in obesity, may be a subsidiary factor in the case. Pregnancy and fasting also cause slowing of the pulse-rate. Unusual retardation is very rarely physiologic, and must be regarded as syncopal in tendency, whether it be transient or persistent. Cases may also occur in which the nervous mechanism of the heart is more affected than the heart-muscle, and in these Morrison thinks that the fault probably lies in the accelerant as well as in the inhibitory system of the heart, and that the elucidation of this condition requires investigation of the accelerant motor tracks from their origin to their termination.

Riesman[5] uses the term **paulocardia** to designate the subjective sensation of intermission or stopping of the heart that is sometimes observed in cases of gastric neurasthenia.

Schott[6] describes various **gouty affections of the heart.** In 1 case he observed extreme bradycardia; in 2 other patients, suffering from chronic gout,

[1] Berl. klin. Woch., Sept. 30, 1895.
[2] Med. News, Dec. 14, 1895.
[3] Jour. Am. Med. Assoc., June 27, 1896.
[4] Lancet, Nov. 25, 1895.
[5] Phila. Polyclinic, vol. iv. No. 36, p. 363.
[6] Berl. klin. Woch., May 25, 1896.

he observed the gradual development of aortic stenosis. Usually the symptoms are those of cardiac neurosis, and frequently there is dilatation of the right ventricle. In 1 case repeated severe attacks of angina pectoris were permanently cured by treatment directed only to the gouty conditions. The treatment consisted in careful diet and hygiene and the ordinary methods of treating gout and such cardiac complications as may have been produced. Regarding hydrotherapy, he warns energetically against the danger of the production of a gouty crisis, as this usually produces permanent injury to the heart.

Wadleigh[1] advocates the use of **strophanthus** in angina pectoris, and has used it in several cases with very good effect.

EXOPHTHALMIC GOITER.

Etiology.—Brissaud[2] contributes an elaborate study of the theories regarding the **nature of exophthalmic goiter,** and concludes that it is impossible at the present time to formulate a satisfactory explanation. Grave's disease is a group of symptoms rather than an independent disease. Regarding the pathologic changes in the thyroid little satisfactory knowledge exists, and the author points out that in 25 cases of various chronic diseases he has found changes in this gland. It is difficult to accept the view that the disease is caused by an affection of the medulla oblongata, since this does not explain the enlargement of the glands, unless Fillehne's and Derdufie's observations on rabbits, showing the development of exophthalmos, enlargement of the thyroid, and tachycardia after removal of the restiform bodies, are to be considered. Undoubtedly disturbance of the function of the glands plays some part, but the nature of this remains in question. Regarding the treatment, he holds that injection or use of thyroid extracts is still an experimental stage.

Martius[3] in a discussion of the same subject reviews the theories of Möbius, who holds that the disease is a form of toxemia due to morbid action of the thyroid gland, and of Buschan, who holds that it is due to disturbed innervation. He points out that the theory which locates the disease in the medulla oblongata is not supported by pathologic evidence, while that which hypothecates disease of the sympathetic nerves lacks support from the fact that it fails to explain certain of the manifestations. His own view is that there is a disease of the central nervous system, and he points out that it has a resemblance to a chronic intoxication. Whether this is due to poisons produced by the thyroid gland, or by such as are allowed to circulate from inhibition of the destructive action normally exercised by the thyroid gland, remains unsettled.

Putnam[4] discusses very thoroughly exophthalmic goiter. He objects to the theory that the disease resides in the medulla oblongata, because the lesions found are neither uniform nor constant, and therefore are probably secondary not primary. He thinks also that the theory of thyroidal secretion is still extremely vague and lacks a sound basis. Of 2 cases in which Putnam recommended extirpation, 1 died on the eighth day after the operation with-

[1] Med. News, Mar. 14, 1896.
[2] Mercredi méd., No. 34, 1895.
[3] Berl. klin., May, 1896.
[4] Boston M. and S. Jour., Aug., 1895.

out apparent cause, and the other was seriously prostrated for a long time, but gradually improved. It was suggested that her serious prostration might be due to the absorption of some part of the large quantity of thyroid secretion that escaped from the wound. He believes that probably the best treatment is the local use of electricity applied by prolonged faradic currents, so as to literally squeeze out the contents of the glands. Parenchymatous goiters sometimes disappear with great rapidity as a result of feeding with thyroid extracts. Regarding the theory of hypersecretion of the gland, he objects that some of the symptoms of exophthalmic goiter may appear when the gland shows no enlargement whatever, and it is not proved that a normal thyroid may have a hypersecretion. Another objection is that thyroid preparations do not always aggravate, but sometimes relieve, the symptoms. He also objects to the theory that the thyroid secretion is vitiated. The removal of a part of a morbid goiter relieves the symptoms, but it should not alter the nature of the secretion. He finally concludes that the symptom group of this disease really indicates a mode of dissolution of the nervous system, and he regards it as a degenerative neurosis making a line of cleavage at some point at which the nervous functions were exposed to the strain. In the discussion following this paper Dr. Shattuck declared that in his experience the administration of thyroid had not given encouraging results. Kinnicutt[1] in discussing the possibility of the thyroid origin of Graves' disease refers to 4 cases collected from the literature in which, after attacks of classical Graves' disease, myxedema developed and was cured by the thyroid treatment. [It must be admitted, after a careful review of existing knowledge, that the solution of the question of the etiology of the disease under consideration is still quite distant. The theories ascribing it to primary thyroid disease are attractive, and seem to be supported by certain facts, but other evidence is of a decidedly contrary kind.]

Symptoms and Diagnosis.—Abram[2] describes 5 cases, in 2 of which autopsies were performed. In 1 of the cases the symptom of Joffroy was discovered—viz. the absence of facial contraction when the patient suddenly turned her eyes upward. Tremor was a constant and early symptom. Exophthalmos generally occurred late, and was ascribed to distention of the vessels behind the globe. In one of the cases it disappeared suddenly during an attack of diarrhea. In the fatal cases he found no increase of the intraorbital fat. The thyroid glands in the second fatal case were enlarged and the alveoli small and filled with cells. Colloid material was absent. In 1 of the cases of rather acute character masses of leukocytes were found at the point of entrance of the large bloodvessels. There was no excess of vascularization. The author regards the disease as a result of excessive secretion of the gland.

Fridenberg[3] reports a case of exophthalmic goiter, in which the ocular symptoms and the thyroid enlargement were unilateral, and he refers to 13 other cases similar in character recorded in literature. Of these, 3 presented left-sided exophthalmos like his own, but 1 of these had enlargement of the

[1] Med. Rec., Apr. 18, 1896.

[2] Lancet, Nov. 16, 1895.

[3] Med. Rec., July, 1895.

thyroid gland of the opposite side. His own case was a woman of 24, married 4 years previously, who had aborted a year later, but had not been subsequently pregnant. Domestic disturbances had arisen, especially during the last 6 months, and within a few weeks of her first appearance she presented nervous excitability, palpitation, fatigue after slight exertion, and dyspnea. The left eye presented exophthalmos with Graefe's sign; the right eye was normal. The left side of the face was slightly more reddened than the right, and the right half of the thyroid and the isthmus were enlarged.

Maybaum[1] holds that the diagnosis of **abortive exophthalmic goiter** (*struma exophthalmique fruste*) should be made only when two of the cardinal symptoms are present, and when the third is absent for a long time. If the latter were not the case, the diagnosis would rather be that of Graves' disease passing from a milder to a severer stage. The author reports 2 cases, in the first of which exophthalmos and tachycardia with tremor and other nervous symptoms, but without thyroid enlargement, occurred, and in the second tachycardia and enlargement of the thyroid gland and nervous symptoms, but no exophthalmos. Donellan[2] reports a case without exophthalmos.

Regarding the **prognosis** of Graves' disease, Pribram[3] states that in a large proportion of cases, hospital treatment, with rest and care, is often followed by improvement and sometimes by recovery. He has seen recovery in cases in which even dropsy or other serious complications were present.

Treatment.—Stabel[4] reports 10 cases of Basedow's disease in which **thyroid glands** or tablets of **thyroidin** were administered. In 3 cases the gland itself was given, but in each the results were disturbing. In the other 7 cases the thyroidin tablets were used without the least beneficial effect even in the cases treated early, and in all of them excessive rapidity of the pulse and nervous disturbance were produced. He therefore concludes that the remedy is contraindicated in this disease. Silex[5] reported to the Berlin Medical Society a case of exophthalmic goiter in which thyroid extract proved efficient. The patient was a woman of 40, whose illness began Feb., 1895. She had been treated with arsenic without success, and was in a most critical condition when thyroid tablets were given her by a friend. She took large doses of these, and improvement was at once remarkable, and in a short time she was restored to a normal condition. Ewald, in discussing the above, remarked that though the case which he reported a year ago was not benefited by the thyroid extract, such cases as Silex's had been observed, but must be looked upon as exceptional. [We are disposed to coincide with Ewald. Certain cases have undoubtedly been favorably influenced by thyroid treatment, though our own experience has been unfavorable.] V. Jaksch[6] states that he has found thyroid treatment of no value in 6 cases of Grave's disease, though it has caused no unpleasant symptoms.

[1] Zeit. klin. Med., Bd. viii. H. 1, 2.
[2] Med. News, Sept. 7, 1895.
[3] Wien. klin. Rund., No. 44, 1895.
[4] Berl. klin. Woch., Feb. 3, 1896.
[5] Ibid., Feb. 10, 1896.
[6] Centralbl. f. innere Med., Apr. 25, 1896.

Scholz[1] has investigated the effect of thyroid extract upon metabolism in a patient suffering with exophthalmic goiter as contrasted with the effect in a healthy person. He found the excretion of nitrogen slightly less than the ingestion in both cases, before the treatment. After the administration the nitrogen elimination increased somewhat, but not greatly. The most marked disturbance detected concerned phosphorus-elimination. There was but a slight amount of phosphorus in the excreta before the administration. After the administration it increased remarkably, especially the intestinal elimination, which became 10 times as great as before the treatment.

Eder[2] reports a case of exophthalmic goiter that was treated with thyroid extract, potassium bromid, hypodermic injection of nuclein prepared from spleen, and extract of spleen, without benefit. She was then treated with an **aqueoglycerin extract of thymus gland,** and showed slight improvement (purely subjective). Six months later, still continuing the treatment, the pulse had dropped from 104 to 92 (single observation) and the patient "felt better."

Starr[3] has found **glycero-phosphate of sodium** useful, and reports an instance in which there was rapid improvement after all other forms of treatment had been employed without effect for 1½ years. The drug is administered in doses of 20 gr. 3 or 4 times daily. The remedy was introduced by Trachewsky, and has been employed successfully by Chibret.

Rhenier[4] believes that a larger number of successes are to be attributed to the **electric treatment** of exophthalmic goiter than to any other method. He prefers galvanism, and states that the diminished frequency of the heart-beats is marked after the application. Bartholow[5] reports 2 cases of exophthalmic goiter, 1 completely cured and the 2d much improved by persistent galvanism and the internal use of duboisin, picrotoxin, iron, manganese, and in the 2d case also thyroid extract.

Claude Wilson[6] reports a case which had been treated unsuccessfully by the usual remedies. Thyroid extract and thymus gland had not been tried. He finally decided to use the **Schott method** of treatment of cardiac disease, and gave saline baths at 90° F. with marked benefit. [In connection with cases like the above it is well to remember that certain cases of cardiac disease with marked failure of compensation present symptoms very like those of primary exophthalmic goiter.]

Starr[7] has collected **190 cases** of exophthalmic goiter in which some form of **operation** was done. Of these, 74 are reported as completely cured, many of them having been watched 2 to 4 years before the result was published. Exophthalmos sometimes persisted for a year after operation; 45 of the cases were improved and 3 were not benefited; 23 cases died immediately after operation, and, as hemorrhage was not the cause and careful aseptic precautions

[1] Centralbl. f. innere Med., Oct. 26, 1895. [2] Boston M. and S. Jour., Jan. 23, 1896.
[3] Med. News, Apr. 18, 1896.
[4] Rev. internat. de Méd et de Chir. Prat., Aug. 25, 1895.
[5] Med. News, Nov. 16, 1895. [6] Practitioner, Sept., 1895. [7] Loc. cit.

were taken, he holds that the cause of death is a sudden poisoning of the system by excessive absorption of thyroid juice. This may be due to the manipulation of the thyroid gland or to the increased absorption by torn vessels or to the stimulation by the ether. He approves Kocher's suggestion that local anesthesia by cocain should be used instead of ether. The symptoms preceding the fatal result are sudden hyperpyrexia with rapid pulse, nervous distress, sweating, cardiac failure, and collapse. Kinnicutt[1] has collected altogether 187 cases in which surgical operation was undertaken. Of these, 13 died as the result of the operation, 60 recovered, 47 improved, 11 were unimproved, and in 25 the result is unknown; 31 cases reported by Kocher have either improved or been cured. Abram[2] refers to 138 cases in which operation was undertaken. Of these, 114 were improved, 17 cured, and 4 died.

Congenital Heart Disease.—Jacobi[3] reports the case of a man who died at 29 with **patent ventricular septum.** In 1891 he had an attack of great dyspnea, palpitation, and lividity. There was a loud cardiac murmur. Four years later a second severe attack occurred, and at this time it was noted that the superficial veins were not distended, though there was marked cyanosis. The impulse of the heart was strong, but the size of the organ little if at all increased. There was a loud systolic murmur about the ensiform cartilage. Pneumonia developed, and subsequently facial palsy. The patient died, and postmortem the heart was found slightly enlarged. The pulmonary artery was normal, but had no conus. The aorta was small, and the innominate, the left carotid, and the subclavian arteries were all small and branched off before the arch was formed. The ventricular septum was defective in its upper part. The foramen ovale was closed. No ductus Botalli could be found.

Boisdeau[4] reports an interesting case of congenital heart-disease. The child at birth breathed badly and was completely cyanosed. Either side of the neck was occupied by great swellings which proved to be enlarged veins, and it is of interest to note that the head was smaller than normal, the biparietal diameter being 7 cm., the occipitomental 10 cm. The child died some hours after birth, and the autopsy showed cicatricial retraction of the tricuspid leaflets, with enlargement of the orifice and great dilatation of the auricle.

Gerrard[5] reports a case of **dextrocardia.** The apex-beat was situated on the right side 4½ inches external to the ensiform cartilage, and no impulse was to be found in the normal position of the apex. The superficial cardiac dulness extended from the third right interspace to the liver. A harsh fremissement was felt at the apex. A double murmur was heard at the mitral and in the normal aortic region. A murmur was also heard at the pulmonic cartilage. The patient had had rheumatism, but so slightly that Gerrard believes the cardiac lesions were probably congenital. Another instance of transposition of the heart was reported by Haines[6]. Posselt[7] reports 2 cases of transposition in healthy adults. (See Figs. 3, 4.)

[1] Loc. cit. [2] Loc. cit. [3] Arch of Ped., Nov., 1895.
[4] Jour. de Méd. de Paris, Mar. 29, 1896. [5] Lancet, Apr. 18, 1896.
[6] Brooklyn Med. Jour., Mar., 1896. [7] Deutsch. Arch. f. klin. Med., Oct. 25, 1895.

Rupture of the Heart.—Kouskoff[1] records a case of rupture of the heart, and refers to the rarity of the condition. He observed it but 3 times in 8000 autopsies. In the present case the patient, a professor in the University of Kieff, had been suffering with influenza for 10 days. The sputum and stools were bloody and there was a slight cough. The temperature was



FIGS. 3, 4.—Diagrams showing the position of the heart, liver, and spleen in two cases of dextrocardia (Deutsch. Arch. f. klin. Med., Oct. 25, 1895).

37.5° C. The patient died suddenly after catheterization. The autopsy showed a rupture in the anterior wall of the left ventricle. The heart increased in size, and the whole was bulged out somewhat in the form of an aneurysm. A thrombus was found in the descending branch of the left coronary artery, and the aorta and smaller branches were atheromatous. The heart-muscle surrounding the rupture was yellow and necrotic. Tanner[2] reports an exceedingly interesting case. There was a history of a slight slip upon the ice 6 hours previous to the occurrence of pain, the latter coming on suddenly. At first there was nausea, which was relieved by an emetic, and a few hours later partial collapse, which was promptly relieved by stimulants. The pain continued for some days, gradually growing worse, and was described by the patient as a gnawing at the heart. Repeated examinations of the liver, chest, and heart revealed nothing except a dulness of the valvular sounds. In the last days chloroform and then large doses of morphin were used with temporary relief. Death occurred on the 8th day. During the course of the case the pain seemed to disappear when his attention was otherwise occupied. The pericardium was adherent to the ventricle by several fibrous adhesions. The wall of the left ventricle was thin and sunken toward the apex, and a hole the size of a knitting needle was found in it 1½ in. from the apex and the same distance from the septum. Over this was a clot more or less stratified, adherent to the walls and filling a third of the cavity. There was thrombosis of the left coronary artery.

Embley[3] reports a case presenting a peculiar high-pitched musical sound

[1] La Presse méd., Mar., 1896.

[2] Boston M. and S. Jour., 1895.

[3] Australian Med. Jour., Aug. 20, 1895.

continuous throughout the entire cardiac cycle. The heart was enlarged, but no definite murmur was made out. There were pain and numbness in the left arm, and a slight hemiplegia had existed. Subsequently dyspnœa developed and death occurred suddenly. At the autopsy an **aneurysmal dilatation** of the posterior wall of the left ventricle was found, from which perforation into the pericardium had occurred. Embley believes that the gyrations produced in the blood retained in the aneurysmal sac produced the peculiar sound.

Samguine[1] reports a case of acute articular rheumatism without at first evidence of cardiac lesion, but at the 6th day there was intense pericardial pain, and a pericardial friction-sound developed. Four days later the patient on attempting to rise fell back, and in a few minutes was dead. At the post-mortem about 1 quart of blood was found in the pericardial sac, which was covered with shaggy lymph. In the posterior aspect of the left ventricle there was a small ulcer, in the lower part of which a small opening traversed the thickness of the myocardium. The valves of the heart were normal.

Cardiac Syphilis.—Jacquinet[2] refers to the rarity of cardiac syphilis. Up to the present 102 cases have been recorded, but of these not over 61 are trustworthy and complete. The myocardium is the most frequent seat. The valves are usually free. The actual lesions are gummata of the myocardium, varying in size from a millet-seed to a pigeon's egg, and a fibrous myocarditis, the latter leading to marked insufficiency of the heart. The symptoms are in general those of myocarditis from other causes. The author refers to attacks of pseudoangina occurring during secondary stages and due either to anemia or to the circulation of some poison. He refers, however, to asthmatic attacks and precordial pains as symptoms of genuine cardiac syphilis.

Loomis[3] contributes a paper on syphilitic lesions of the heart with a report of 4 cases. From his experience and the study of the literature he classifies these affections as—1. Gummatous, in which case there may be recent soft reddish or grayish masses or older dry yellow and cheesy nodules; 2. Fibrous myocarditis, which may be localized, occurring as well-defined masses of large size, or diffuse and accompanied by inflammation of the arteries; an intermediate type occurs in the outer zone of gummata where fibrous tissue may develop around the cheesy center; 3. Amyloid degeneration; 4. Obliterating endarteritis is a less important syphilitic affection. Among the 4 cases reported, 3 were instances of gumma, the first occurring in a man of 35 who had died suddenly in apparent health, and in whom the only lesion discovered post-mortem was a large mass in the anterior wall of the left ventricle; the second being a young woman who had contracted syphilis three years before; and the third a woman who had become infected two years previously. The lesions in both of these latter cases were similar in situation and type. The author notes that the occurrence of cardiac failure in the prime of life and in the absence of rheumatic history, of valvular disease, arterial changes, or kidney complications, should lead to the suspicion of syphilis in persons giving syphilitic

[1] Presse méd., No. 15, p. 91. [2] Gaz. des Hôp., No. 93, p. 917.
[3] Am. Jour. Med. Sci., Oct., 1895.

histories. Rapid improvement and amelioration of the cardiac symptoms following appropriate treatment is important in the diagnosis. [Undoubtedly, as the author states, the role of syphilis in the production of cardiac disease has received less attention than it deserves, and the frequency of syphilitic heart-disease is probably not as yet appreciated; on the other hand, it is likely that some of the instances in which gummata have been suspected and diagnosed have been instances of myomalacia with indurative changes of the peripheral zones or surrounding the necrotic focus.]

DISEASES OF THE ARTERIES.

Atheroma.—Weber[1] contributes an article on the relations of **syphilis and atheroma.** He first points out the striking fact that aneurysms are more frequently caused by syphilitic disease of the arteries than by ordinary atheroma. Further, he holds that atheroma in itself is merely a degenerative process, though often preceded or accompanied by inflammation. Syphilis or other inflammation may, therefore, locally predispose to atheroma.

Dickinson[2] in his lectures upon the cardiovascular changes of renal disease contributes certain statistics from the study of cases of different sorts, which show that the entire cardioarterial system undergoes progressive hypertrophy from the beginning to the termination of renal disease. These changes affect the smallest vessels, the heart, and the intermediate channels in practically the same degrees.

Durr[3] refers to the **diagnosis of chronic aortitis.** Among the significant symptoms is deep-seated retrosternal pain. The direction in which this pain radiates he believes may be utilized to determine the extent of the atheromatous process. When the disease is in the neighborhood of the coronary arteries the pain runs to the heart-muscles; when the arch of the aorta is involved the extension is toward the upper extremities or the head. A very characteristic symptom is a peculiar fear of death, without disturbance of the respirations, but the most characteristic symptoms are the increase of dulness to the right of the sternum in the second interspace and the accentuation of the second heart-sound.

Boehle[4] records 2 cases of diseases of the aorta which he considers as instances of syphilitic disease. The lesions resemble those found in a previous case reported by him. The most marked characteristic was scar-formation in the media with retraction of the intima. The primary alteration he finds is round-cell infiltration around the bloodvessels of the media and adventitia. Nowhere did he find ruptures of the media.

Aneurysms.—Souchon[5] contributes an excellent review of the subject of multiple aneurysms in the same patients. We must refer to the original paper for the details. Clark[6] reports a case of varicose aneurysm communicating with the aorta and superior vena cava. The symptoms began suddenly, no

[1] Am. Jour. Med. Sci., May, 1896.
[2] Lancet, July 20, 1896.
[3] France méd. et Paris méd., No. 32, 1895.
[4] Deutsch. Arch. f. klin. Med., Bd. lv.
[5] N. Y. Med. Jour., Nov. 2, 1895.
[6] Lancet, Jan. 18, 1896.

signs of aneurysm having previously existed, and the patient remained alive one month. The right arm and the face and neck and upper part of the chest were edematous, while the left arm and the left side of the chest were not so. The author explains this by the assumption that there had been sufficient time for collateral circulation. Cavazani [1] refers to the lateral movement of the trachea (Cardarelli's sign) as an indication of aneurysm. The longitudinal movements (Oliver's tracheal tugging) is less significant. The author reports a case of marked hypertrophy of the heart with aortic insufficiency and a double mitral lesion in which tracheal tugging was present, but Cardarelli's sign was absent, and 2 cases in which aneurysm existed and in which the latter sign was well marked.

Bignoni [2] reports a case of aneurysm of the thoracic aorta successfully treated by **Macewen's method** of introducing needles into the sac so as to project on the inner wall and form the starting-place for a clot. The case was that of a farmer aged 68, who presented a rounded pulsating tumor on the right side of the sternum which had all the evidences of aneurysm, the walls being evidently quite thin. The case was referred to Sacchi for surgical treatment. He introduced 2 needles on the 30th of November, removing them after 24 hours; needles were subsequently introduced on the 4th, 6th, and 10th of December. Even after the introduction of the first needle there was notable increase in the consistency of the tumor, while the size decreased, becoming eventually one-third of the original size. On the 10th of January the last needle was introduced, as there was one point where the tumor was soft. In introducing this it was noticed that the needle met with a resistance as if it were passing through a fibrous and partly calcified tissue.

Stenosis of the Aorta.—Flint [3] records a case of narrowing of the arch of the aorta. The patient, a man of 21, entered the hospital complaining of hematemesis which had begun 2 days previously. Physical signs of phthisis were wanting, but a distinct systolic and diastolic murmur replaced the heart-sounds. The pulse was typically collapsing in character and capillary pulsation was easily developed. Postmortem examination showed that in addition to the lesion noted the aortic valves were almost completely destroyed by ulcerative endocarditis. Immediately above the valves was found a diverticulum fully 1 in. in depth, projecting as a polypoid mass into the cavity of the right auricle, while the stenosis already alluded to was seen at the junction of the transverse and descending aorta, and was so narrow that it barely admitted a small probe.

Embolism and Thrombosis.—Oestreich [4] reports the case of a young man of 32 who died suddenly of embolism of the coronary arteries. Postmortem a large pedunculated thrombus was found in the aorta, and was doubtless the source of the embolism.

[1] Gaz. degli Osped. et delle Clin., No. 84, 1895.

[2] Resoconti clin. Statist. degli Ospedali di Genova, 1894; Centralbl. f. innere Med., June 6, 1896.

[3] Lancet, Sept. 28, 1895.

[4] Centralbl. f. innere Med., 1896, No. 2.

Finny[1] reports a case of cardiac insufficiency, the patient dying very suddenly. At the autopsy the sinus of Valsalva and the beginning of the left coronary artery were found filled with a clot which could be traced along the artery for two inches.

Vasomotor Edema.—Tchukoff[2] discusses a condition of general edema without albuminuria due to vasomotor disturbance. He has observed 6 cases, all men between the ages of 25 and 60 years. There were 2 varieties, the acute and the slow. In the latter the anasarca developed slowly, requiring 3 or 4 months. In the former serious symptoms might occur in the course of a week, with the appearance of liquid in all the serous cavities. The hair was liable to fall out. Albumin was never found in the urine excepting when there was extreme ascites. The blood exhibited an unusual quantity of reduced hemoglobin, but was otherwise approximately normal. The other organs were normal, excepting that the right heart was frequently dilated and that there existed a moderate degree of arteriosclerosis. After recovery the patients were much emaciated. Tchukoff believes that the cause is some profound disturbance of the vasomotor mechanism, frequently due to an old syphilis, and almost invariably treatment with mercury or iodid of potassium gives brilliant results.

DISEASES OF THE THYROID GLAND.

Acute Thyroiditis.—Bradshaw[3] reports a case of acute inflammation with swelling of the thyroid gland. It subsides without suppuration, although at one time the symptoms of dyspnea were alarming.

Goiter.—Dock[4] notes the frequency of **goiter in Michigan,** having been struck by the common occurrence of this disease in his clinical experience in that State as compared with the number of cases observed in Philadelphia or Galveston, where his material had been more abundant. Communications from various physicians in the State showed the very great prevalence of the disease. Thus in Calumet there were found 50 well marked cases in a population of 14,000, while at the Central Mission, a few miles away, 10 cases occurred among less than 2000 people, and in Adrian 30 cases were found in a population of less than 9000. In Gaillard, Otsego Co., Dr. Parmeter reports that one-fourth of the children born in that place and reaching puberty have goiter; 52 reports give a total of 477 cases, not including those in the copper region, and though the figures do not compare with those found in the goitrous regions of Europe, the disease is evidently quite prevalent. Morris[5] reports that in Hamilton, England, with a population of 2000, he has seen 55 cases of goiter. The soil is excessively chalky, and the water-supply is obtained from deep wells sunk into the chalk.

Munson[6] in a study of goiter **among the Indians** of the United States sums up the following as the salient points: There is a strong regional predis-

[1] Dublin Jour. of Med. Sci., Apr. 1, 1896.
[2] Rev. de méd., Aug. 10, 1895.
[3] Med. Rec., Nov. 2, 1895.
[4] Med. News, July 20, 1895.
[5] Brit. Med. Jour., July 16, 1895.
[6] N. Y. Med. Jour., Oct. 26, 1895.

position to goiter among the Indians, the Crows, Menominees, and Northern Cheyennes being particularly predisposed. Goiter is a distinctly localized disease, and appears to be uninfluenced by the high altitude, climate, or water containing calcium salts. Unsanitary surroundings, depressing conditions, and improper and excessively nitrogenous diet, with hereditary influences, are prominent causes. Sex and puberty exert a strong influence. The tumor is smaller than among the white races, and locality appears to affect the growth of the tumor as well as its frequency.

Sabrazes[1] records a case of simple goiter in which, after failure of the iodin-treatment, the use of a glycerol extract of the thyroid gland resulted in complete cure.

Stabel[2] in a study upon the value of **thyroid treatment** in goiter and in Graves' disease has found that the fresh glands selected with care and preserved on ice do not give rise to the toxic symptoms so frequently reported of late and referred to by the name thyroidism. In 25 cases of simple goiter of parenchymatous and fibrous character improvement was noted in 23, while in 2 the disease seemed completely arrested or cured. The treatment must, however, be continued to maintain the results obtained. Subsequently he employed tablets of thyroidin, and found it considerably less advantageous than the fresh glands.

Winkler[3] contributes a résumé on the use of thyroid extract as a method of treatment, and concludes that it has been useful in ordinary struma, but uncertain in Graves' disease. The tablets of extract seem less likely to cause unfavorable results upon the heart than the fresh thyroids.

Holmes[4] contributes an interesting paper upon sporadic goiter. We note only the statistical portions bearing upon the effect of different forms of treatment. The author recommends injections of iodin, and the statistics certainly bear out his claims.

	Fibrous.	Cystic.	Mixed.	Exophthalmic.	Totals.	Results		
						Cured.	Relieved.	Negative.
Males:								
15–25	1	.		2	3			
25–50	7	1	3	. .	11			
Females:								
15–25	57	. .	7	51	115			
25–50	82	18	23	35	158			
Totals	147	19	33	88	287			
Treatment:								
Injection	135	1	30	17	183	111	39	33
Tapping	. .	15	. .	. .	15	9	2	4
Drugs and external applications	12	3	3	71	89	11	40	38
Totals	147	19	33	88	287	131	81	75

[1] Gaz. Hebdom. de Méd. et de Chir., Apr. 5, 1896.
[2] Berl. klin. Woch., Feb. 3, 1896.
[3] Centralbl. f. d. gesammte Therap., 1896, H. 3.
[4] Lancet, Nov. 9, 1895.

DISEASES OF THE GASTRO-INTESTINAL TRACT.

DISEASES OF THE PHARYNX AND ESOPHAGUS.

Sticker[1] finds that **chronic pharyngitis** associated with dry pleurisy is always due to one of two causes, either syphilis or tuberculosis. In a first group of 4 cases each of the patients suffered from tubercular heredity, and had dry pleural friction sounds with the other characteristic symptoms, associated with exacerbations of chronic pharyngeal inflammation. In regard to his second group, comprising cases of pharyngitis in association with syphilis, he urges more liberality in accepting signs of hereditary syphilis. In particular, he holds that deformities of the teeth of various kinds are to be regarded as syphilitic when the teeth of both parents are found to be well formed and normal. Further, he considers it an important sign of syphilis if, after a number of normal children, others are born showing signs of degeneration, such as imperfect development, deformities of the nose, and discolorations of the skin, or if the first child is particularly weak and the others approximate more and more closely to the normal. He reports, in all, 9 cases of this combination, in all of which the disease of the pharynx had, according to the history, arisen without any external cause or injurious influence from environment.

Gourtade[2] reports 3 cases of **dysphagia,** in all of which local patches of **mycosis** were found either at the base of the tongue or upon the lingual tonsil, cure following their removal.

Dionisi[3] reports a case of a patient who came under his observation complaining of pain in the pharynx and later in the epigastrium. On examination pharyngitis, bronchopneumonia, and albuminuria were found. Three days later the patient died in coma, and a condition of **croupous esophagitis** was discovered postmortem. Bacteriologic examination showed the presence of streptococci, and the author concludes that the condition was similar to what is known as **croupous gastritis.**

Fränkel[4] records a case of **tuberculosis of esophagus** in which disseminated nodules were found. The infection had been conveyed through the circulation.

Johnson[5] reports 2 interesting cases of **esophageal stenosis.** The first was apparently a pure neurosis, and always worse when the patient was anxious or frightened about taking food. He was cured by the bromids, electricity, and dilatation. The second case was that of a tinsmith, aged 62, who had suffered for 30 years from dysphagia. There was frequent vomiting, the matters being sometimes mixed with blood. It was impossible to introduce a sound. At the autopsy the walls of the esophagus were found to be dilated for its whole length until just above the cardiac orifice, where there was a stricture apparently fibrous in character, and in a sacculated dilatation above it a few shallow ulcers.

[1] Deutsch. Arch. f. klin. Med., Bd. 57, H. 1 and 2.
[2] Jour. de Méd de Paris, June 14, 1896.
[3] Riforma Med., Apr., 16, 1896.
[4] Münch. med. Woch., 1896, No. 2.
[5] Buffalo Med. Jour., Feb., 1896.

Mintz[1] reports 3 cases of cancer of the esophagus in which the chemical and motor functions of the stomach were determined, being normal in each case. In the first the esophageal obstruction was not severe enough to prevent the passage of a sound, and the gastric conditions were determined by removing the gastric contents through a tube. In the other case gastric fistulæ had been formed, and the condition of the stomach was determined through these. In one case there was slight excess of acid in the gastric juice. [In a case of complete obstruction of the esophagus under our observation the gastric functions were determined by introducing test-meals through a gastric fistula that had been established. The motor power was preserved and digestion was conducted in a normal manner.]

Rosenheim[2] contributes a further report of the use of the **esophagoscope.** The operation can only be thoroughly successful when the esophagus is cleaned of food-particles. In case of stagnation of the food due to stenosis the esophagus must be washed out. Passage of a bougie must not be practised immediately before the operation, as the blood obstructs the view. Cocain is often necessary. The author details the result of observations in 18 cases of carcinoma of the esophagus. The instrument proves specially useful when there is little stenosis on account of the secondary ulceration and tumor. It was also of advantage to localize the growth.

V. Hacker[3] refers to his experiences with the esophagoscope of Mikulicz-Leiter. The instrument is inserted with the patient sitting upright upon the table, and with the head held as far back as possible, while the operator draws the larynx forward from without. Cocain applied to the pharynx obviates spasm. After the instrument has entered the esophagus its further introduction is accomplished with the assistance of the patient, who turns and gradually assumes the horizontal position upon his back, while the operator at the same time inserts the instrument more deeply into the esophagus. The examination is finished with the patient lying upon his back, the head over the edge of the table. Careful manipulation makes the operation a safe one, and the author has had no mishap in considerably over 200 cases. Pain and difficulty in swallowing sometimes occur after the operation, but give little trouble. In only 2 cases has he found it impossible to insert the instrument. [Other references to the use of this instrument will be found below, under *Diseases of the Stomach.*]

DISEASES OF THE STOMACH.

Methods of Examination.—Salzer,[4] having discussed some of the disadvantages of the Ewald and the Leube-Riegel test-meals and of those of other writers, suggests in their place, particularly in private practice, where numerous sittings cannot be obtained, the following: Early in the morning the patient is given 30 to 50 g. of cold roast, free from all fatty and membranous parts and cut into small pieces $\frac{1}{8}$ in. wide and about $\frac{1}{2}$ in. long, 250 c.c. of warm milk

[1] Wien. klin. Woch., No. 3, 1896.
[2] Deutsch. med. Woch., No. 50, 1895.
[3] Wien. klin. Woch., Nos. 6, 7, 1896.
[4] Jour. Am. Med. Assoc., Jan. 11, 1896.

or milk and water, and 30 to 50 g. of well-toasted wheat bread or Zwieback; 4 hours after this meal 30 to 50 g. of stale wheat bread without crust or toasted particles, and 300 c.c. of warm water or tea without sugar or milk. An hour later a thin, soft rubber tube is inserted and allowed to fill with the fluid. When the latter appears at the upper end, the tube is carefully withdrawn and its contents collected in a porcelain dish. If the liquid flows freely from the tube *in situ*, more may be obtained. If residue of the first meal is still present, he takes it as an indication that the digestive function is more or less impaired. The material may then be subjected to the usual tests. [The method does not seem to offer any particular advantages and is not free of deficiencies.]

Talma[1] recommends the use of meat-broth instead of test-breakfasts and test-dinners for the study of gastric secretions. The advantage of this is that it does not enter into combination with the organic and inorganic acids, and it suffices to stimulate sufficient secretion to give reliable results. The patient receives a solution of 3 g. of Liebig's meat-extract in 1 l. of water. The solution is neutralized and administered warm. An hour later the gastric secretion is expressed, the patient in the mean time having been in a reclining position with the surrounding temperature comfortable. Under the normal conditions the acidity at this time will be found to correspond to 1% of HCl.

Determination of Hydrochloric Acid.—Strauss[2] has studied the value of Töpfer's reagent for the quantitative estimation of HCl. The method is a simple one, but is not certain, on account of the difficulty of distinguishing the color-changes caused by minute quantities. Like the 1% watery solution of Congo-red, it is more delicate than Günzburg's reagent or Congo paper. Strong solutions of phosphates ($\frac{1}{2}$%) cause changes of color similar to those produced by weak HCl, and organic acids give a result with both solutions. The author concludes that the Congo solution is more delicate than Töpfer's reagent. Because of the difficulty in determining absolutely the substance causing the reaction, he prefers Congo paper. Hoppe-Seyler[3] has studied the same method, and holds that in spite of its somewhat indefinite end-reaction it is practically useful. Einhorn[4] has investigated the value of Töpfer's method as a test for HCl in the stomach-contents. Töpfer regards the reagent as a most delicate test for HCl, and one not influenced by organic acids, excepting lactic acid in quantities above 0.5%. Friedenwald corroborates this statement. Einhorn finds the test more delicate than Günzburg's solution, as it responds when HCl is present in the proportion of 1 to 50,000. Combined HCl does not influence it. Lactic acid, however, gives the same response if present in proportions of 0.1%. Töpfer's reagent may be used as a quantitative test if HCl is present and lactic acid absent. Five c.cm. of the filtrate are taken, and a drop of a 1% solution of phenolphthalein and $\frac{1}{2}$% solution

[1] Nederl. Tijdschr. v. Geneeskunde. 1896, ii. p. 416.

[2] Deutsch. Arch. f. innere Med., Bd. lvi. H. 1 and 2.

[3] Münch. med. Woch., No. 50, 1895.

[4] N. Y. Med. Jour., May 9, 1896.

of Töpfer's reagent are added. The mixture is titrated with decinormal sodium hydrate solution until the red color disappears. This indicates the quantity of HCl; then further titration is practised until the red color reappears. The total number of c.cm. of soda solution used up to this time indicates the total acidity.

Simon[1] has investigated the relation between the quantity of indican and the character of the gastric juice. He finds that there is excessive indican when the hydrochloric acid is deficient or wanting. When there is hyperacidity the amount of indican is normal or subnormal, excepting in case of ulcer of the stomach. When there is abundant lactic-acid formation in the stomach in the absence of hydrochloric acid, indican is not increased.

Matthieu and Trehen[2] believe that there is a relation between the **acidity** of the gastric juice and that **of the urine,** the latter increasing with the former. For a few hours after ingestion of food the urinary acidity is decreased, sometimes with a preliminary temporary increase; and if a considerable quantity of acid is removed from the stomach either by vomiting or lavage, the urine may even become alkaline. The urine of cases of hyperchlorhydria contains more acid than cases of hypochlorhydria.

Lactic Acid.—Strauss[3] employed the following modification of Uffelmann's method: A closed separatory filter is used; 5 c.cm. of gastric juice and 25 c.cm. of ether are placed in it and shaken. The gastric juice is then allowed to flow off, and the ether is again shaken with water containing a few drops of weak (10%) solution of officinal chlorid-of-iron solution. With 1% of lactic acid an intense green color is produced; with 0.5% a paler green occurs. The method is reliable as indicating quantities of lactic acid large enough to be considered important.

Oppler[4] has proposed a method for **estimating the activity of the pepsin** in the stomach. An hour after a test-breakfast the contents of the stomach are excreted and the organ washed with distilled water. The washings and stomach-contents are diluted up to 1 or 2 liters. Diluted hydrochloric acid is added until the total acidity stands at 77. The nitrogen of a 0.2% albuminate solution is then estimated by Kjeldal's method, and 20 c.c. of this solution added to 50 c.c. of the stomach-contents and digested for 3 hours. After the precipitation of the undigested albumins, acid-albumin, etc., the nitrogen of the digested portion is estimated and the percentage of albumin thus calculated. The author obtained values for normal individuals, and found those in chronic gastritis much diminished. The same thing was found in gastric carcinoma, particularly when the body of the stomach was affected. When the pylorus was involved pepsin was sometimes present, though hydrochloric acid had disappeared. Diminution of pepsin occurs in atony, and dilatation of the stomach only when mucous catarrh with lessened acid secretion is present. Increased pepsin occurs in ulcer, acid gastritis, chronic gastrosuccorrhea, and occasionally in chlorosis. Pepsin-secretion as measured

[1] Am. Jour. Med. Sci., July–Aug., 1895.
[2] Arch. gén. de Méd., Nov., 1895.
[3] Berl. klin. Woch., No. 37, 1895.
[4] Centralbl. f. innere Med., Feb. 1, 1896.

by the activity of the pepsin seems to run parallel with the secretion of hydrochloric acid. The author thinks, therefore, that the quantitative estimation of pepsin need hardly go into general use.

Strauss[1] has studied the alterations which occur in the **specific gravity of the gastric juice** in various conditions and in health. The density of the liquid is lower when the unaltered gastric juice is predominating, and grows greater with the subsequent admixture of the products of digestion. The physiologic limits, 1 hour after the test-breakfast or $2\frac{1}{2}$ or $3\frac{1}{2}$ hours after a test-dinner, lie between 1010 and 1020. A specific gravity below 1010 is particularly frequent in cases of hyperacidity, hypersecretion, and fermentation; that above 1020 practically only in cases of subacidity.

Meinert[2] questions **the value of illumination** as a mode of diagnosis in diseases of the stomach. In particular, he doubts the reliability of the deductions made by Martius and Meltzing, and holds that the position of the lamp in the stomach and the condition of the coils of intestines exercise a decided influence on the apparent size and shape of the stomach. Comparing results obtained by illumination with those secured by palpation and measurement of the capacity of the organ, he came to the conclusion that the diophane is not reliable, though it may serve a useful purpose in locating tumors of the stomach or vicinity or displacement of the spleen. Kuttner[3] denies the assertion of Martius and Meltzing that the position and shape of the stomach may be determined with a gastrodiaphane when the stomach is empty or only partly filled. Under these conditions the light may be conducted through neighboring coils of intestine or the abdominal walls. The stomach should be filled completely, when a reliable result may be obtained. He further denies the advantage claimed for illumination in the differentiation of gastric dilatation and gastroptosis. The movability with inspiration, which Meltzing claims to be greater in proportion to the degree of apposition with the diaphragm, Kuttner holds is independent of this.

Turck[4] describes his **gyromele,** which consists essentially of a stomach-tube with a rotating center which can be set in motion by a suitable apparatus. If furnished with an ivory bulb, it can be used for determining the size of the stomach, and if with a sponge, for cleansing purposes and massage of the walls. He has also contrived a gastric motor meter consisting of a small oblong rubber bag which may be inflated after insertion and then connected with a manometer. It indicates the character of the movements and the number of the movements per minute and the degree of energy. Boas[5] has recently used the apparatus of Turck for the determination of the outline of the stomach, and in 25 out of 30 cases has found it an efficient aid. [We cannot convince ourselves that this instrument may be safely used. The danger of injury to the mucous membrane is not inconsiderable when a soft stomach-tube is employed, and is much increased in the case of such an apparatus as that referred to.]

[1] Zeit. f. klin. Med., p. 221, Bd. xxix.
[2] Centralbl. f. innere Med., No. 44, 1895.
[3] Berl. klin. Woch., No. 37, 1895.
[4] Am. Med. and Surg. Bull., July 1, 1896.
[5] Centralbl. f. innere Med., Feb. 8, 1896.

Rosenheim[1] in discussing the use of the **gastroscope** states that in 70% of his cases the straight instrument was introduced into the stomach without difficulty or after overcoming very little resistance. The patient is placed flat on his back and the pharynx is cocainized. The operation is most apt to prove difficult in neurasthenic persons or persons presenting considerable obesity. Sometimes the preliminary use of the stomach-tube may serve to make the subsequent employment of the gastroscope easy. Occasionally slight angulation at the end of the instrument or a corkscrew-like curve of the last 7 to 10 cm. may render the introduction more easy. In the discussion of Rosenheim's paper Pariser exhibited an instrument constructed at his suggestion some time previously, and stated that it is his view that the only indication and use for the instrument is in the diagnosis of pyloric cancer in doubtful cases. He referred also to the dangers supposed to exist in some cases. As far as the use of the instrument in esophageal investigation is concerned, he notes the experience of v. Hacker, who was able to remove foreign bodies with the aid of this instrument. Ewald in discussing the paper particularly questioned the safety of the procedure, and Rosenheim in concluding admitted that certain dangers exist, though he called attention to the fact that dangers also exist for the passage of stiff instruments of any kind for exploration or diagnosis.

Moritz[2] has made studies of the **intragastric pressure** with the aid of a specially constructed mechanism. There is a constant positive pressure in the stomach, which is partly due to the contraction of its own walls, but largely to the pressure of surrounding viscera. The pulsations of the heart and the inspiratory sinking of the diaphragm cause increase of the pressure. When inspiration is performed by elevation of the lower ribs there may, contrarywise, be a diminution of pressure. The stomach is divided in its physiologic functions into the pyloric region and the fundus. In both portions there are elevations of pressure, but in the fundus the contractions are regular, wave-like, and weak. These serve to convey the liquid portions to the antrum and through the latter, while the solid matters are retained to be further acted upon. The muscular contractions of the pyloric portion are, on the contrary, very active.

Relations of Salivary Digestion.—Burger[3] has studied the activity of salivary digestion and the relation of this to local and general conditions. The patient was given a biscuit which he chewed for a minute, and the mass was then treated with 0.27% HCl or water (50 c.c. of either), according as the amylolytic action was to be stopped or to be allowed to proceed further. The amount of action was then determined by the polariscope. He found that neither the amount of saliva, the condition of the teeth, the state of the general health, nor the greater or less active HCl secretion had any influence upon this salivary digestion. It therefore appears that the latter is independent of disturbances of the gastric functions.

Robertson[4] finds that saliva and gastric secretion, mixed with a solution of

[1] Deutsch. med. Woch., No. 45, 1895.
[2] Zeit. f. Biol., Bd. xxxii. H. 3.
[3] Münch. med. Woch., No. 10, 1896.
[4] Edinb. Med. Jour., May, 1896.

starch when there is 0.05% of hydrochloric acid in the gastric contents, leaves the starch unchanged after 2 hours. If the mixture be carefully neutralized, the starch is wholly converted within 10 minutes. This was true as well of the secretion from the normal stomach as of that obtained from cases of chronic gastric catarrh. When the gastric secretion alone was mixed with the starch-solution no conversion occurred either with the secretion of a healthy stomach or the secretion of a stomach affected with chronic gastric catarrh, but when the secretion from a case of pernicious anemia was taken, it was found that in a mixture of 30 c.c. 1% starch solution, and 10 c.c. of the unhealthy gastric secretion with an acidity of 0.016% HCl, at the expiration of 1 hour 0.6% of reducing-substance was present. When the starch-solution was introduced into a healthy stomach, care being taken that no saliva was mixed with it, after the lapse of an hour considerable starch was still present, although there was also a trace of reducing sugar, and erythrodextrin was found in considerable amount. After 2 hours the starch had practically disappeared and there was no erythrodextrin or sugar. The effects in the case of chronic gastric catarrh were similar but slower. In the case of pernicious anemia, however, at the expiration of 1 hour the quantity of reducing sugar amounted to 1%; an hour later this had completely disappeared. These results were repeated, and saliva was mixed with the starch before it was injected into the stomach, it appearing that the acid completely inhibited the action of the reducing agent of the ptyalin, and when the gastric contents were withdrawn and neutralized no further reduction took place. Robertson concludes from this that even a short stay in the stomach during the digestion of a simple carbohydrate suffices to completely destroy the ferment of ptyalin.

Hamburger[1] studied the action upon starch of the saliva, pancreatic and intestinal juices, and the blood. He used the saliva of man, the pancreatic and intestinal secretions of dogs, and the blood of bullocks and dogs. One c.cm. of either of these was allowed to act upon 50 c.cm of a 1% potato-starch solution at 30° C. After 24 hours the amount of decomposition, estimated as glucose, is determined. These figures are—saliva, 0.3; intestinal juice, 0.26; pancreas, 0.36; and blood, 0.80. The maximum in the case of saliva is reached within an hour, with the blood in 24 hours, with the pancreatic juice in 45 minutes, and in cases of intestinal juice less rapidly even than in case of the blood.

Changes in Form and Position of the Stomach.—Meinert[2] contributes an elaborate article upon the normal and pathologic positions of the stomach and the methods of determination. In the new-born child the stomach occupies a vertical position, but it soon assumes the position described by Luschka, and so remains through life, unless it is influenced by defective condition of the thorax or abdomen or by improper clothing. After the 6th year the vertical position of the stomach is again noticed in increasing proportion with increasing age, especially in girls. The alteration is particularly rapid between 11 and 15, and of 50 girls examined at a public school at the age of

[1] Pflüger's Arch., Bd. lx. p. 543. [2] Centralbl. f. innere Med., Mar. 21, 28, 1896.

12, almost half presented dislocated stomachs. Among girls of 14 examined, he found **gastroptosis** in 80%, and among the women presenting themselves at his private gynecologic clinic, 90% presented gastroptosis. On the contrary, he estimates that this dislocation occurs in but 5% in the male population of Dresden. The cause of this dislocation is found in improper clothing, and particularly in tight lacing. Abnormalities of the chest-conformation may contribute, and other causes are occasionally active. Regarding the position of the stomach in gastroptosis, the author points out that the cardiac end remains fixed at the 12th dorsal vertebra, while the pylorus moves downward, leaving the epigastrium free of gastric tympany. Regarding the method of demonstration, he holds that that of distention with gas by the use of effervescent mixtures or by direct inflation with atmospheric air gives the most satisfactory results. Direct percussion or percussion after water has been allowed to flow into the stomach permits no accurate differentiation of dilatation from dislocation, and the methods of illumination he holds, with Boas and others, as elusive on account of the danger of transmission of light through adjacent coils of intestine. The method of inflation is a special advantage in demonstrating the lesser curvature and indicating the position of the pylorus, thus at once distinguishing between dislocation and actual dilatation. The position of the stomach during life, but not its size, may be accurately verified postmortem. [We are disposed to agree with many of the author's statements, though we cannot believe that dislocation of the pylorus is as frequent as he states. It has certainly not been our experience to find the vertical position or gastroptosis as frequently in American girls and women as he has found in the Germans. The value of inflation of the stomach is not, we believe, overestimated in the least. For several years we have used this method in our practice and as a means of clinical demonstration.]

Schwerdt[1] in a study of 95 cases of **enteroptosis** found that 89 occurred in women and but 6 in men. The stomach was displaced and atonic in 69 cases. The kidneys were also affected on the right side in 86 and on the left in 4. In 18 cases the abdomen was pendulous, in 11 the uterus was prolapsed, and in 27 there was pelvic inflammation with hemorrhage. In 1 case there was total enteroptosis, except that the spleen was unaffected. In most cases the hand could be pressed into the abdomen, showing a diminished intra-abdominal pressure. In gastroptosis the system is atonic and diagnosis must be made from dilatation of the stomach. Movable liver and spleen rarely exist. Regarding the cause the author considers the following active: heredity, unsuitable habits, chronic diseases, as tuberculosis, chlorosis, hysteria, corsets, and pregnancy. The disease is not fatal, but leads to many unpleasant disturbances—notably dyspepsia, headache, palpitation, and dyspnea.

Fleiner[2] discusses at great length the **functional disturbances** produced by changes in the form and position of the stomach and colon. These dislocations of the stomach are produced either by pressure from below, such as may occur from meteorism, by artificial distortion of the body, such as is produced by cor-

[1] Deutsch. med. Woch. 23, 1896.

[2] Münch. med. Woch., No. 42, 1895.

sets, or by enlargement of the abdominal organs, such as the enlarged spleen of leukemia. Congenital dislocations, however, such as occur in cases of kyphosis or abnormally narrowed thorax, seem to produce no functional disturbance, probably because the stomach gradually learns to adapt itself to its altered condition. Frequently, in women, the first result of the compression of the corset is diminution of the size of the stomach. This prevents the ingestion of sufficient nourishment, and therefore the disappearance of a certain amount of food from the mesentery. As the result of this, the stomach has again room to distend and resume its normal size. These deformities, however, frequently occur in women who have never worn corsets, and are then the result of the relaxation of the abdominal walls which follows childbearing. The most important functional disturbance is the increased difficulty that the stomach has to empty its contents. Later, there is usually found a greatly diminished secretion of the gastric juice and the development of a nervous dyspeptic condition. The sinking of the colon is usually the result of very tight lacing. This produces distortion of the ascending colon, and sometimes also of the right kidney, which becomes movable; the left kidney, however, usually remains in its place. Manifold disturbances of the function result, the most important of course being constipation, produced by the difficulty of peristalsis. Colic-like pains are at the same time produced by a spasmodic condition of the intestinal muscles. In conclusion, he records 3 cases in which various conditions of dislocation of the abdominal organs existed. In the second of these there existed considerable induration all around the transverse colon, which lay rather low in the abdomen, and upon incision this was found to be a purulent pericolitis. No perforation, however, had taken place, and it was supposed that the organisms had penetrated the mucous membrane during a long persisting fecal immobility.

Schwerdt[1] contributes a study of **intraabdominal pressure occurring in cases of enteroptosis and in health.** The author distinguishes two forms of pressure in the hollow viscera—(1) that which is due to the tonic contraction of the walls of the organ, and (2) that which is due to pressure upon the organ by the surrounding structures. The former of these depends upon the muscular walls. The pressure exerted by these upon the contents is naturally increased when there is distention of the abdominal walls or increased contents in the abdominal cavity. The second form of pressure is naturally greater in the most dependent parts of the abdomen, being practically *nil* just beneath the diaphragm when the patient is erect. Studies of the pressure in the stomach, bladder, and rectum showed the pressure in the first to be 11 cm. of water; in the second 29 cm.; and in the last 39 cm. The figure 11 cm. is taken to represent the contraction-pressure in the stomach alone, since there is no gravitation-pressure from without, and, assuming that the contraction-pressure is practically the same in different parts, the total pressure of 39 cm. in the rectum may be divided into 2 parts, 11 cm. representing the contraction-pressure, and 28 cm. the gravitation-pressure or that due to the weight of the

[1] Deutsch. med. Woch., Nos. 4 and 6, 1896.

superimposed organs. Change of position of course influences the figures very much, and muscular efforts similarly increase the intraabdominal pressure. Thus, taking the former figures to represent the conditions during repose, he found the elevation to a horizontal position of 10 kg. caused a pressure in the stomach of 59 and in the rectum of 78. The latter may be taken to represent 59 cm. contraction-pressure and 19 cm. gravitation-pressure (59 + 19 = 78). This reduction from normal amount of gravitation-pressure is in accordance with deductions we might form from the effects of a severe muscular strain. Regarding enteroptosis, the author found, as we might assume, that the pressure in various positions of the body is considerably decreased. The lowest pressure was found in the rectum, the patient being in a knee-chest position, the explanation of this being that the gravitation occurs in the direction of the elastic anterior abdominal walls.

Gastritis.—Kelynack[1] reports a case of **diffuse phlegmonous gastritis.** Clinically, it was characterized by an esophageal stricture apparently of fibrous nature, persistent incontinence of food, and finally rise of temperature and collapse. At the autopsy a stricture of the cardiac end of the esophagus was found, and the lower part of the esophagus was the seat of an acute septic esophagitis. The stomach was normal in size, but the walls were much increased in thickness, and from the cut surfaces an abundant seropurulent exudation oozed out upon simple pressure. There were no signs of ulceration, new growth, abscesses, or perforation, nor was there general peritonitis. Microscopically there was considerable parenchymatous degeneration. The tissue was infiltrated with compressed short rod-like organisms that closely resembled the bacterium coli communis.

Turck[2] states that the diagnosis of **gastritis glandularis chronica** is largely made by the microscope, pieces of mucous membrane being snipped off by an instrument devised by himself, and by the careful examination of the contents of the stomach. Bacteriologically, the disease is not characterized by the presence of a single germ, but rather of a group of various microorganisms. These groups colonize in the mucous layer that adheres to the stomach-walls and produces toxins which cause the functional and pathologic phenomena of inflammation. Treatment consists of their thorough removal with the gyromele. [The author places much more reliance in the microscopic examination of bits of mucous membrane than seems justified. Nothing is more difficult than to arrive at satisfactory conclusions from such examinations. We have previously stated our objections to the instrument recommended.]

Einhorn[3] concludes, from a study of the gastric mucosa such as may be found in the wash water after using lavage, that a positive diagnosis cannot be made from it, and that it is not permissible to consider that such anatomic changes as may be found are the cause, and not possibly the result, of the functional disturbances.

Robertson[4] describes a disease peculiar to the Australian aborigines, in

[1] Lancet, Mar. 14, 1896.
[2] Med. News, Apr. 4, 1896.
[3] Med. Rec., June 27, 1896.
[4] Internat. Med. Mag., Oct., 1895.

which the stomach becomes perfectly hard and gradually enlarges enormously. The body wastes, while the appetite is voracious, with an especial craving for meat, though the patient can eat but little at a time, when the food does not seem to nourish. The course is slow and ends in death. No postmortem has ever been obtained.

Functional and Neurotic Disturbances.—Kelling[1] describes a case of **periodic vomiting** occurring in a woman of 42 whose mother and grandmother had suffered with similar attacks. Dizziness, fainting, and diarrhea, with the vomiting, were the striking features, and the attacks were preceded by edema of the limbs of fugacious and wandering character. Emotional disturbances seemed to be the exciting cause, and the author concludes that the condition is due to a hysterical vasomotor disturbance. Drugs were of no avail, though morphin lessened the severity of the paroxysms.

Debove[2] records a case of extreme **anorexia** occurring in a woman of 29. The patient had been an excessive alcoholic, but had given up this habit. Six months before her admission she had suffered with excessive vomiting, but this subsided, and for 3 months preceding her admission she had complete anorexia. There were no stigmata of hysteria, and the author believes that the underlying cause was some form of psychic disturbance. He refers to the fact that anorexia is frequently a predisposing cause of tuberculosis.

Devries[3] reports a case of **merycism** occurring in a man who was practically an imbecile and suffered from incipient phthisis. There was nausea, and the patient described the cud as being somewhat sweet with an acid taste like lemonade without lemon. Immediately preceding the regurgitation movement of the stomach could be felt. These were further assisted by the contractions of the diaphragm and abdominal muscles. As a measure of treatment he produced complete narcosis by ether and continued it for 1 hour and 40 minutes. After this the symptom disappeared entirely.

Einhorn[4] makes a further report on **achylia gastrica,** as he terms the condition in which gastric juice is not secreted. The report includes some details of 10 new cases. He agrees with the systematic writers (Ewald, Boas, Bouveret) that the disease is often a form of chronic glandular gastritis, but maintains that some cases are of neurotic origin. The prognosis as to life is good, the small intestine replacing the stomach in the process of digestion. The indications for treatment are to increase the motor power of the stomach, and to arrange the diet so that it is easily accessible for the intestinal digestion. The first indication is best met by lavage or faradization or by bitters; the second, by giving the food in a finely broken condition. Vegetables and starchy food may be given in the form indicated, but meat is to be used in small quantities.

Boas[5] contributes an article on **chronic hypersecretion** or **gastrosuccorrhea.** The mere determination of large quantities of gastric juice

[1] Zeit. f. klin. Med., Bd. 29, p. 421.
[2] Progrès méd., 1895, No. 42.
[3] Indian Med. Rec., Apr. 16, 1896.
[4] Med. Rec., July 6, 1895.
[5] Berl. klin. Woch., No. 46, 1895.

does not suffice to make a diagnosis. The clinical symptoms (burning, eructations, occasional vomiting, and pain) must also be present. The stomach presents evidences of lack of motor power, and the increased quantities of gastric juice must be constant. He holds that the motor insufficiency leads to increased secretion of gastric juice on account of the irritation by the retained food; and he refers to a case of his own and one of Rosenheim's in which relief of a benign pyloric obstruction caused cessation of hypersecretion.

Schule[1] has made some investigations regarding the secretions in the **"fasting stomach."** He studied the subject in 9 cases, 6 of whom had been trained by previous experiments to swallow a stomach-tube. He found that in 31 of 34 trials the stomach contained a certain amount of liquid which was always acid in reaction, and therefore contained some gastric juice. Free hydrochloric acid was present only 7 times; bile, peptone, and pepsin occasionally. The cause of the presence of gastric juice he regards as saliva or other secretions swallowed during sleep. He has had no experience of cases of continuous hypersecretion. He would regard hyperacidity, even though the quantity of the contents was small, as pathologic, but the mere increase of quantity itself is not necessarily abnormal.

Treatment of Chronic Gastric Diseases.—Schule[2] has investigated the influence of **sleep** upon the processes of digestion, and has found that there is a distinct increase of acidity after a test-meal when the patient sleeps during the interval, as compared with the result obtained in the same person waking. At the same time there was a distinct retardation of the motor activity. The author therefore advises against sleep after meals, particularly in persons suffering with digestive disturbances with excess of HCl.

Chittenden and Mendel[3] contribute an interesting study of the influence of **alcohol** and alcoholic drinks upon the chemical processes of digestion. Their observations agree largely with those of Sir Wm. Roberts. They find that moderate quantities of pure alcohol—say 1 or 2% of absolute alcohol, corresponding with 2 or 4% of proof spirit—do not retard gastric digestion, but seem if anything to stimulate it. Large quantities—that is, more than 5 or 10% of absolute alcohol—retard digestion. The effect on pancreatic digestion was more marked; the effect on salivary digestion less so. Whiskey, brandy, rum, and gin, forms of liquors containing much alcohol and little residue, act practically the same as pure alcohol upon gastric digestion. Small quantities of fusel oil do not retard digestion. On pancreatic digestion these forms of alcohol are inhibitory, probably on account of a substance contained in the solid matter and connected with the acidity of the fluid. Wines have little effect on gastric digestion in small quantities, but retard pancreatic digestion more than the stronger liquors, and inhibit salivary activity markedly in proportion to their acidity. Malt liquors retard all forms of digestion, on account of extractive matters contained. Haan[4] has

[1] Berl. klin. Woch., No. 52, 1895.

[2] Ibid., Nos. 50, 51, 1895.

[3] Am. Jour. Med. Sci., Apr., 1896.

[4] Compt. rend. des Séances de la Soc. de Biol., t. 36, 1895.

studied the effect of alcohol upon the various functions of the stomach experimentally, using dogs for the purpose. The continued administration of large doses causes a rapid decrease of the motility of the stomach after a primary increase, and the production of HCl also falls off rapidly, while the combination of acid with albuminous bodies occurs less readily than normal.

Wroblewski[1] has studied the action of various kinds of **pepsin** under various conditions outside the body. He found that different acids varied in the degree in which they stimulated digestion. Oxalic acid was first in power, and HCl was next. Various alkaloids and alkaloidal salts exercised an influence, particularly coffee, which stimulated the digestion markedly, and veratrum, which retarded it.

Reale[2] believes that **lavage** of the stomach is indicated in all cases of chronic gastric catarrh when hypochlorhydria and atony of the stomach are present, and that cure may be obtained more rapidly by this method than by any other. The action also upon the various symptoms, such as vomiting and the subjective symptoms particularly, and upon the secretion of hydrochloric acid, is always beneficial. He reports 11 cases in which this treatment was used with excellent results. [Objection cannot be made too frequently to the routine practice of lavage in gastric diseases. While we have obtained excellent results in many cases, some are undoubtedly injured; and the stomach-tube-habit should always be guarded against.]

Norstrom[3] describes the technic of **gastric massage.** He finds that the best position is upon the right side, the left overhanging the middle line. It usually requires several seances before the patient is able to endure the maximum treatment. The results are stimulation of the muscular coats and of the glands. The treatment is particularly adapted to the idiopathic forms of dilatation produced in instances of nervous trouble, and especially in gastralgia, although in the former group of cases there is no diminution in the size of the stomach, merely a disappearance of the symptoms.

Bradbury[4] reports 7 cases of gastralgia with varying symptoms, treated with **potassium bichromate** in capsule, each containing $\frac{1}{10}$ gr. In 5 of these cases there was complete disappearance of all the symptoms; in 2 there was no improvement. He believes that the drug is a gastric tonic, but that its action may in part be due to the fact that it is an acid salt. It should be given only upon an empty stomach.

Bonnefin[5] records a number of instances of intractable vomiting treated by **faradization** of the pneumogastric nerve. He details the histories of 4 cases of this character, in all of which the treatment indicated was highly satisfactory.

Green,[6] having concluded that vomiting could not occur in an adult without fixation of the diaphragm, has devised a modified **tracheal tube** that is to be inserted in cases of persistent vomiting. This has acted well in some cases by preventing the closure of the glottis.

[1] Zeit. f. Physiol. Chemie, Bd. xxi. H. 1.
[2] Wien. med. Woch., Apr. 4, 1896.
[3] Med. Rec., Mar. 7, 1896.
[4] Lancet, Sept. 14, 1895.
[5] Jour. de Méd. de Paris, July 7, 1895.
[6] Med. News, July 6, 1895.

Turck[1] advocates a new apparatus by means of which he is enabled to introduce a rapidly alternating **hot and cold spray** into the stomach. It consists essentially of two large bottles in which pressure is maintained by means of compressed air connected with a stomach-tube; each connection is supplied with an easily manipulating cut-off. One bottle is filled with hot water, and one with cold, and the cut-offs are opened alternately.

Pyloric Obstruction.—Manasse[2] reports an interesting case of a gastric concretion. The patient, a man accustomed to the use of alcoholics in excess, drank alcoholic solutions of shellac. At the autopsy a gastric ulcer was found, and near the pylorus a concretion of dark green color and stratified arrangement, measuring 10 by 5 by 4 cm. and weighing 75 g. Chemic examination showed this to be composed of shellac. Similar cases have been reported by Friedländer and by Langenbuch (quoted by Friedländer). [Concretions of this kind might easily lead to pyloric obstruction in the same way as peach-stones and other bodies that have been swallowed.]

Bouveret[3] records instances of obstruction of the pylorus due to **gall-stones,** pointing out that this is the least frequent of all causes, excepting congenital stenosis. The stenosis may occur from the formation of adhesions due to localized peritonitis, from spasms of the pylorus due to contraction of the loaded stomach or irritation of neighboring inflammation, from fixation of the pylorus by adhesions, and an angular bend near the pylorus due to the presence of food in the stomach, and, finally, from the presence of a large stone fixed in the duodenum. Regarding the diagnosis, the author calls particular attention to the fact that in cases in which fixation of the pylorus exists the symptoms of dilatation persist while the patient is upon his feet, but cease when he rests in bed. A history of gall-stones or of biliary colic aids greatly in the diagnosis.

Gross[4] describes a case which he regards as one of spasm of the pylorus, and suggests the term **pyloralgia.** This case occurred in a woman of nervous temperament who was subject to attacks of pain in the region of the stomach, which ceased after vomiting sour matters. In one attack, which was witnessed by himself, there was distention and violent pain over the stomach the day after injudicious diet. The attack was finally relieved by introducing a tube and removing large quantities of intensely acid material. This had a total acidity of 130 and contained excess of HCl. The author points out the differential diagnosis from other painful affections of the epigastrium, and suggests that the spasm by its continuance, whether painful or not, or by its repetition, leads to hypertrophy of the pylorus.

Dilatation of the Stomach.—Hayem[5] reports a case of dilatation of the stomach with physical signs of heart-disease. There was dyspnea with 60 respirations per minute, edema of the lungs, tenderness of the abdomen, and a rasping systolic murmur was heard in the fourth intercostal space and a curious

[1] Med. News, Mar. 21, 1896.
[2] Rev. de Méd., Jan., 1896.
[3] Berl. klin. Woch., 1895, No. 33.
[4] N. Y. Med. Jour., Mar. 7, 1896.
[5] Med. moderne, July 13, 1895.

bruit at the apex. All the symptoms disappeared after washing out the stomach daily.

Wissel[1] has investigated the **gaseous fermentation** in the stomach. A certain amount of gas consists of the atmospheric air which has been swallowed. The oxygen of this is partly used in bacterial growth or absorbed, and excess of CO_2 occurs. In most cases CO_2 and H are present in equal proportions, besides the atmospheric air. The amount of fermentation could be determined by the analysis of the gases. The more fermentation and the less atmospheric air, the more CO_2 and H and the lighter the sp. gr. of the gases. Regarding the effect of medicines, he found that creasote affects the fermentation but little; bismuth subnitrate acts similarly, but is not advisable; the salicylate and sulphite of sodium act more powerfully, but bicarbonate of sodium is most useful. The presence of HCl has little effect. The occurrence of fermentation is of no importance as an indication of lack of motor power, as there was decided fermentation without motor insufficiency in at least 2 of his cases.

Strauss[2] reports a case of gastric disorder in which putrefactive fermentation led to formation of H_2S. A careful bacteriologic study showed that the microorganism which causes this fermentation was the Bacillus coli communis. There was absence of HCl and of lactic acid. In a second case, in which pyloric stenosis was brought about by corrosive action of oxalic acid, stagnation of the food and overproduction of lactic acid were present, and the same microorganism was discovered. In a third case high-grade motor insufficiency, due to carcinoma of the pylorus, and in which free HCl, but no lactic acid, was found, considerable gaseous fermentation occurred and the same bacillus was discovered.

At the recent session of Congress of Swedish and Norwegian surgeons, held at Christiania, Borelius considered the question of **surgical treatment** of gastrectasis, and he reports the case of a man of 31 years who had a dilatation of the stomach, the organ extending to the pubis. In November, 1894, he operated, taking a reef in the wall of the stomach (suture en bourse) in the anterior and posterior wall. The patient was temporarily improved and gained 20 pounds; then lost flesh again and went down hill. In May of 1895 he performed a gastroenterostomy, which seems to have relieved the patient of all his trouble. He does not state to what the dilatation was due.

Gastric Ulcer.—Nauwerck[3] believes that microorganisms are important in the production of gastric ulcers in some cases. The matter is difficult to determine because of the likelihood of secondary deposits of bacteria. He refers to 2 cases of hemorrhagic erosions with evidence of beginning formation of peptic ulcers, in which deposits of bacteria within the walls were discovered. One of these was a case of rheumatic endocarditis, and the other a case of streptococcus infection during scarlet fever. He denies the view of Langerhans,

[1] Hoppe-Seyler's Zeit. f. physiol. Chemie, Bd. xxi., 1895.

[2] Berl. klin. Woch., May 4, 1896. [3] Münch. med. Woch., Nos. 38, 39, 1895.

that hemorrhagic erosion and round ulcer have no relation with each other, basing his opinion upon the consideration of 37 cases.

Osler[1] records an interesting case in which a visible **contractile tumor of the pylorus** occurred with ulcer of the stomach. The patient first came under observation with unmistakable symptoms of gastric ulcer. Later a phantom tumor was noticed from time to time in the epigastrium. It would appear and disappear at intervals, remaining for from one half to a minute, and disappearing gradually, sometimes with an audible sizzling sound. It was extremely hard when distended, and when relaxed it was felt as a sausage-shaped tubular body which could be rolled about beneath the fingers. The patient died, and at the autopsy a large contracted and thickened pylorus was discovered. The wall in one place was 14 mm. thick. An area having the appearance of a healing ulcer was found within. The muscular coat of the entire stomach was hypertrophied. There was no evidence microscopically of carcinoma.

Mettler[2] describes a case of gastric ulcer remarkable for the long period during which symptoms existed; 8 years before examination the patient began to be troubled with dyspepsia, and during all this time suffered at times from a slight boring or gnawing pain which shot through to the back and was felt near the angle of the left scapula. After partaking of solid food the pain would sometimes become very acute and definitely localized. There was almost always more or less pain in the left hypochondrium, and its site never shifted anteriorly or posteriorly.

Hawthorne[3] reports 2 cases of secondary **parotitis** following gastric ulcer. The first case, a woman of 42, had had constant pain in the epigastrium with vomiting for 3 weeks, and hematemesis on the day of admission. Her health previously had been good. The symptoms subsided, but in 2 weeks elevation of temperature with right-sided parotitis developed. The swelling subsided without suppuration. The second case, a woman of 26, was admitted to the hospital on account of severe hematemesis, which was repeated 3 days after admission; 4 days after this right-sided parotitis with fever developed and suppuration ensued. The author has been able to find but 1 case in the literature in which there was undoubted gastric ulceration in association with parotitis.

Wells[4] reports an interesting case that he observed in Neusser's clinic, of a young woman 25 years of age who suffered from vomiting after meals, the vomit containing a copious admixture of blood. Examination of the blood showed that it was entirely normal, and subsequently the diagnosis of hysteria was made and confirmed by the presence of the stigmata. [The presence of blood in the vomited matters in cases of hysteria is not unusual.]

Strauss[5] advocates the administration of **sugar** in cases of ulcer of the stomach or hyperacidity, since he has found in his experimental work that the

[1] Montreal Med. Jour., Aug., 1895.
[2] Jour. Am. Med. Assoc., Feb. 22, 1896.
[3] Glasgow Med. Jour., July, 1895.
[4] Med. News, Mar. 14, 1896.
[5] Zeit. f. klin. Med., Bd. xxix. p. 221.

administration of solutions of sugar delays the secretion of HCl. The quantity given should not exceed 60 g. per day, divided in small doses.

Watson[1] records a most interesting case of **hour-glass contraction** of the stomach near the pylorus, due to the healing of a gastric ulcer. The patient, a woman of 32, had an attack of jaundice with pain in the epigastrium 7 years before. She vomited blood and was quite ill, but eventually recovered. Seven years later eructations, nausea, and tenderness developed, and finally pain and vomiting became almost constant. She lost 40 pounds in weight, was very anemic, and menstruation was absent for 6 months. An operation was done, and a cicatricial contraction was found near the pylorus. An anastomosis was made between the parts of the stomach on either side of the contraction, and perfect recovery followed.

Blume[2] describes 27 cases of gastric and duodenal **perforation** in which no operations were performed, and 17 in which some form of operation was attempted. Of the former 27 cases, 7 recovered, 16 died rapidly (1 to 10 days), and 4 after a considerable interval (1 to 3 months). Peritonitis always occurred, and the rapidity with which this became general determined the duration of life. In the cases which recovered the diagnosis was made by the occurrence of severe pain in the region of the stomach and the secondary development of peritonitis. The management of the case consisted in the administration of large doses of opium or morphin and the most carefully regulated diet, beginning, if possible immediately, with small quantities of food by the mouth. Rectal enemata were not employed. Of the 17 operated cases which he has collected, 3 were instances of perforation of the pyloric end or of the duodenum, and 1 of these recovered; 1 case involved the posterior wall of the stomach and recovered; 4 cases affected the anterior wall, of which 1 recovered; 9 cases were in the neighborhood of the cardia, and 3 recovered. [It is evident that early and carefully considered operation is always justified.]

Gastric Carcinoma.—Ebstein[3] in discussing **hematemesis** reports 3 cases in which, shortly after severe muscular strain caused by lifting heavy weights, the patients had hematemesis, and subsequently symptoms of gastric carcinoma, which in 1 case was positively confirmed by the autopsy. He believes that the injury causes a hemorrhagic infiltration of the mucous membrane or the submucosa, and that the injured area was probably digested subsequently by the gastric juice. In 1 case a severe hematemesis occurred, causing death from anemia that apparently arose from some ecchymotic patch of mucous membrane, no ulcer being found either in the stomach or in the intestines. Such cases, he believes, are usually associated with considerable enlargement of the spleen, and arise principally under the influence of general diseased conditions. In the case reported the aorta was chlorotic in type. He further reports 2 similar cases, which, however, did not terminate fatally. Another group of the causes of hematemesis is that in which general injuries of the body, such as severe falls, occasion the hemorrhage. He reports 5 such

[1] Boston M. and S. Jour., Apr. 2, 1896. [2] Nord. med. Arkiv, Nos. 4 and 5, 1895.
[3] Deutsch. Arch. f. klin. Med., July, 1895.

cases of his own with subsequent development of the symptoms of gastric ulcer, and collects 7 similar cases from medical literature. He considers that these gastric symptoms are due to disturbances of the nervous system or of the circulation, the stomach being especially liable on account of the fragility of its vessels and the corrosive quality of the gastric juice. Other causes are mechanic, thermic, and chemic injuries, among the former being the case in which he observed perforation produced by a rusty nail. Liquids at a temperature of 50° C. or more may sometimes produce gastric ulcer, but only in cases already predisposed. In all such cases, however, we are only justified in making a diagnosis of hematemesis following injury.

Kelynack [1] records a case showing the liability of ulcer of the stomach to become converted into cancer. The patient was a man of 27 years, and the author bases his views upon the fact that gastric symptoms had been present for at least 4 years, during the greater part of which time they had been typically those of simple ulcer; there was neither cachexia nor wasting, and the post-mortem showed the growth limited to the ulcer and its immediate neighborhood. It was evidently recent and rapidly growing. An actual tumor had been noticed only within a few months before death, and there was no metastasis; secondly, it had been noticed that HCl was present within a short time before death. Hoppe-Seyler [2] does not confirm Boas in his views of the value of lactic acid as an indication of carcinoma, as he has observed an instance of catarrh of the stomach with abundant lactic acid and no free HCl. This case, with others that have been observed, makes the lactic acid method comparatively valueless.

Strauss [3] reaches a similar conclusion regarding chemic methods as indicating carcinoma of the stomach. One case to which he refers, of cicatricial stenosis at the pylorus with marked motor insufficiency, showed enormous production of lactic acid, while in the second case of carcinoma of the pylorus HCl was present, while lactic acid was absent. Regarding the statement of Boas that the occurrence of lactic acid and H_2S fermentation are inversely related, the one occurring in cases in which the other is absent (lactic acid being present in malignant, H_2S in benign, stenosis), the author states that in a large number of cases of benign dilatations with gaseous fermentation he could not determine H_2S formation. Nevertheless, he does not entirely deny the justification of Boas's assertion.

DISEASES OF THE INTESTINES.

Constipation.—Romine [4] has practised forcible dilatation of the sphincter ani in a number of cases of chronic constipation, 4 of which he reports in detail. The results are usually excellent.

Merkle [5] has found insufflations of **boric acid,** introduced by the ordinary

[1] Brit. Med. Jour., Jan. 18, 1896.
[2] Münch. med. Woch., No. 50, 1895.
[3] Berl. klin. Woch., May 4. 1896.
[4] Therap. Gaz., Sept. 15, 1895.
[5] Münch. med. Woch., No. 52, 1895.

powder-blower, useful in the treatment of intestinal atony with flatulence and constipation. From 30 to 60 gr. of boric acid are thus introduced.

Lauder-Brunton[1] suggests the use of **opium** in cases of constipation arising from abdominal irritation.

Intestinal Obstruction.—Kidd[2] has seen 7 cases occurring in women in which symptoms indicative of intestinal obstruction were associated with movability or displacement of the right kidney. The pressure exerted upon the ascending colon is supposed to be the immediate cause. In addition to this, the nervous influence through the suprarenal and mesenteric plexuses may play a part in the causation. [It has been denied by a number of authors that a movable right kidney can exercise sufficient pressure upon the intestines to cause obstruction. Though we have seen no case in which the colon was obstructed, we have met with several in which dilatation of the stomach seemed to be due to compression of the duodenum by a floating kidney.]

Schietzler[3] reports 2 cases of obstruction of the intestines due to **pressure of the mesentery.** Three cases of similar character have been reported by Kundrat, and the latter explains the condition upon the ground that the mesentery, instead of having the form of an open fan, is like a fan only partially opened. In the downward descent of the intestines, therefore, pressure is exerted upon the duodenum by the edge. Abdominal relaxation is usually the cause of this form of obstruction. Jordan[4] describes a case in which intestinal obstruction was due to **persistent ductus omphalomesentericus.**

De Jolinière[5] calls attention to the symptoms and disturbances which may result from **peritoneal adhesions.** Grave forms of disease may be simulated in such cases, and in particular adhesions of the stomach may produce intense stabbing or dragging pains, vomiting, and dyspeptic symptoms. The pain is usually relieved by the discharge of the food by vomiting, and is absent when the stomach is empty. Intestinal adhesions are similarly characterized by pain, while attachments to the gall-bladder may occasion manifestations resembling biliary colic.

Rolleston and Hayward[6] report the case of a boy aged 12 who suffered with chronic **dilatation of the colon.** He had been constipated since 6 months of age, and the abdomen was greatly distended. Peristaltic waves were visible upon the surface. The condition varied greatly from time to time, the abdomen sometimes being soft and the bowels acting daily; at other times constipation and vomiting would suddenly occur. Treatment was ineffectual, and the patient died. Postmortem great distention and ulceration of the colon were discovered. No stricture or obstruction was seen. [The case resembles the remarkable instance of "giant-colon" reported by Formad, and 1 recently observed by one of the editors.]

Diarrhea.—Pollatschek[7] discusses the value of rectal injections of warm

[1] Lancet, May 30, 1896.
[2] Ibid., Dec. 21, 1895.
[3] Wien. klin. Rund., Nos. 37 and 38, 1895.
[4] Berl. klin. Woch., 1896, No. 2.
[5] Jour. de Méd., Apr. 25, 1896.
[6] Brit. Med. Jour., May 30, 1896.
[7] Wien. med. Woch., May 9, 1896.

natural saline solutions in severe cases of chronic diarrhea. He commences with 100 c.cm., and never exceeds 200, the temperature ranging from 42 to 45° C. This treatment is particularly indicated in curable ulcerative processes. It acts as a sedative, and to a certain extent promotes healing. Musser[1] reports a case of primary carcinoma upon the superior maxilla, with secondary carcinoma of the bones and multiple fractures, death occurring from hemorrhages due to **duodenal ulcer.**

Appendicitis.—Roger and Josué[2] have reported some experiments on rabbits regarding the pathogeny of appendicitis. They injected cultures of the bacillus coli into the appendix and then ligated it, producing suppurative appendicitis. Later they found that simple ligature sufficed, and in the dilated appendix resulting they found the bacillus coli in pure culture. These microorganisms, therefore, while repeatedly found in the appendix, are inoffensive until occlusion of the mouth gives rise to great multiplication. They conclude that any obstruction of the mouth of the appendix is sufficient to give rise to appendicitis. [Our own experience and beliefs are in large measure confirmed by these experiments. Obstruction of the mouth of the appendix by inflammatory swelling of the mucosa of the cecum or by other causes seems to us the first step. Subsequently the microorganisms normally present multiply greatly, and occasion serious danger to the walls of the appendix.] Ramm[3] in considering the nature of appendicitis concludes that it is due to the incarceration brought about by sudden dilatation of the cecum. This causes retention of the contents of the appendix, hyperemia, epithelial desquamation, and consequent infection. He states that it is not infrequent to find an apparently healthy appendix at operations in cases in which the clinical symptoms have been those of appendicitis. Sutherland[4] believes that in many cases the pathology of appendicitis may be sketched as follows: first, the presence of constitutional poison, such as that of rheumatism, producing inflammation of the lymphoid tissue of the appendix, which is thereby so weakened that microorganisms may enter and produce a septic appendicitis or peritonitis. He urges in support of this view the fact that exposure is a potent predisposing cause, and that the early symptoms of appendicitis are frequently purely constitutional. The treatment in such cases, especially where other rheumatic manifestations exist, consists in the administration of salicylate of sodium.

Robinson[5] discusses **rheumatism** as the cause of appendicitis. He urges that there is no good reason why rheumatic inflammation should not attack the region of the appendix, and is confirmed in his belief, in the absence of pathological data, by the therapeutic test. Treatment with any form of the salicylates is sufficient, and frequent doses have, in his own experience, diminished both pain and the inflammatory manifestations in the region of the appendix more frequently than any other routine method. If an anodyne

[1] Univ. Med. Mag., Oct., 1895.
[2] Jour. des Pract., Feb. 8, 1896.
[3] Norsk Mag. for Lagevid., Nov., 1895.
[4] Lancet, Aug. 24, 1895.
[5] Med. Rec., Sept., 1895.

is required, he prefers codein to morphin. He believes that operative treatment in such cases is bad treatment.

Frazer[1] speaks of certain forms of typhlitis that he believes are due to the **uratic diathesis,** and contends that in these cases the intestinal walls, and not the joints, are the seat of deposition. He is particularly confirmed in his opinion by the very beneficial effects in these cases of the salicylate of soda. Morphin in connection with this he believes to act beneficially in two ways: first, by increasing the acidity of the blood, and secondly, by relieving pain.

McArtney[2] reports 24 cases of appendicitis with no deaths, all of which were given purely medical treatment. All of these cases were severe and several had recurrent attacks. Abscesses developed in 4 instances, 2 opening into the bowel, 1 into the bladder, and 1 externally. He believes that if all of these cases had been operated upon at the earliest possible moment, some of them would not have survived the operation, particularly considering the unsuitable surroundings in which they were placed. He concludes that the symptoms of appendicitis are vague, particularly in cases of localized peritonitis, and that this peritonitis is not an injurious but a conservative process; and, further, that recoveries under the opium treatment are not only not exceedingly rare, but that the medical treatment is rational and more successful than is usually admitted.

Dieulafoy[3] in considering the nature and treatment of appendicitis states that **concretions and catarrhal inflammation** are the primary causes. The inflammation of the walls is always a result of local irritation. Obliteration of the lumen occurs by agglutination of the walls, and secondary bacterial invasion follows. Without perforation of the walls the microorganisms invade the tissues and local peritonitis results. Regarding the treatment, though admitting that certain cases recover spontaneously, he believes surgical operation is always indicated. Le Dentu[4] is less radical in his views than Dieulafoy. Though himself a surgeon, he insists upon operation only in cases in which certain distinct indications are present. Ephraim[5] in commenting upon Dieulafoy's paper expresses surprise at his radical views regarding operation, stating that for one who has seen hundreds of cases of recovery under the treatment with opium and rarely a fatal case this point of view seems very peculiar.

Intestinal Concretions.—Mongour[6] reports an interesting case of intestinal calculi. The patient, a woman of 31, neurotic and arthritic, had suffered with digestive disorders and dilatation of the stomach for several years. The symptoms of mucomembranous colitis developed, and there was sharp pain along the colon and obstinate constipation. For 6 or 7 months the patient passed small stones in addition to the membrane. These varied from the size of a seed to that of a nut, and their discharge occupied the period of 2 weeks.

[1] Prov. Med. Jour., Dec. 2, 1895.
[2] Med. Rec., May 2, 1896.
[3] Bull. de l'Acad. de Méd., No. 10, 1896.
[4] Ibid., No. 12, 1896.
[5] Centralbl. f. innere Med., June 20, 1896.
[6] Compt. rend. de la Soc. de Biol., Feb. 28, 1896.

They were homogeneous on section, and were composed of carbonate of calcium and phosphate of magnesia with organic matter and iron. Mongour believes that these stones are formed in the intestines in the same manner that stones are formed in the bile-passages and in the kidney.

Intestinal Infection.—Beco[1] has contributed a most interesting article bearing upon the question of infection by microorganisms from the gastro-intestinal tract. His investigation consisted in the bacteriologic examination of the spleen from ¼ to ¾ of an hour after death, and also 24 hours after death, in 25 cases. In 11 instances the bacterium coli commune was found in the spleen immediately after death; in only 4 cases it was absent, but was found 24 hours later. He explains the subsequent occurrence in these 4 cases as due to multiplication of bacteria during the 24 hours, rather than to postmortem invasion of the spleen taking place during the interval. It is of interest to note that in cases in which other microorganisms were associated with the B. coli commune at the first examination the associated microorganisms were absent at the subsequent examination. The explanation of the author is doubtless a proper one—that the B. coli multiplies at the expense of the other forms. The author also experimented upon animals by administering irritating chemicals, and found that in cases in which repeated death (within 24 hours) occurred, bacteria were absent from the blood and organs, whereas they were present when death occurred more gradually. [These investigations are of extreme interest as bearing on the liability to terminal infections in chronic diseases or in conditions in which lingering death takes place; and they will serve also to rob the Bacterium coli of the importance which has sometimes been attributed to it in connection with widespread diseases with which it has been associated.]

Nuttall and Thierfelder[2] have shown that bacteria in the intestines are unnecessary to the life of guinea-pigs, and therefore of other animals and man, at least when the diet is an animal one. They removed young animals from the mother by Cesarean section, and placed them in a specially constructed jar where they could be fed with sterilized milk and protected from any bacteria. After a week, during which they showed all signs of an active healthy condition, they were removed and examined. Bacteria were wanting in the intestines.

Herter and Smith[3] have investigated elaborately the question of intestinal putrefaction and its effects on the urine. No definite conclusion can be drawn from the amount of ether or sulphuric acid, as the amount and kind of food cause important alterations. A more certain indication is given by the relation between the total and the preformed sulphates. No definite relation exists between the aromatic sulphuric acid and the quantity of indican. The kind of the aromatic substances probably depends upon the species of bacteria causing putrefaction. The constant elimination of 5 mg. of indican in adults, or even less in children, is pathologic. The excess depends upon the increased

[1] Ann. de l'Inst. Pasteur, No. 3, 1895. [2] Zeit. f. physiol. Chemie, Bd. xxi. H. 2 and 3.
[3] N. Y. Med. Jour., June 22 to July 20, incl., 1895.

putrefaction of albumins or deficient altered activity of the bile and pancreatic secretions. In such cases flatulence occurs, and the whole condition may be benefited by change of diet. In other cases there is continuous cause of indican with or without flatulence, uninfluenced by diet. While the aromatic sulphates are probably toxic, it is likely that other substances formed at the same time are rather more important in producing the general manifestation. The quantity of hydrochloric acid in the gastric juice is of doubtful relationship. Finally, disturbances resulting from increased putrefaction were never absent when the relation of the sulphates was below 1 : 8. Among the intestinal antiseptics, salol, resorcin, and salicylate of sodium seem to have some though slight action. Hydronaphtol and betanaphtol are practically useless. Milk diet and pure albuminous or pure meat diet are efficient. Soft-boiled eggs may be employed. Overexercise and sexual excesses must be avoided.

Albu[1] has studied the question of intestinal antisepsis, and concludes that certain remedies (naphthalin, benzonaphtol, and phenolein or isobutylphenol) have some though extremely restricted power. The effect was measured by the relative proportion of aromatic and fixed sulphates in the urine, and of indol, skatol, and phenol in the intestinal excretions. The surest method of intestinal antisepsis is cleansing the bowels by laxatives or enemata and administration of sterile food. Of course the latter is almost impossible, though approximate sterilization may be obtained.

Surveyor and Harley[2] contribute experiments bearing upon the value of **bismuth subnitrate** and **betanaphtol** as intestinal antiseptics. In experiments outside the body the former substance is the more powerful when large doses are used, but internally the latter proves more efficient, since the constipating effect of the bismuth counterbalances its effects as an antiseptic.

Intestinal Anthrax.—Krumholz[3] reports a case of intestinal anthrax manifesting itself with choleraic symptoms. Both the small and large intestines contained numerous hemorrhagic elevations and generalized edema. There was swelling of the spleen, of mesenteric and retroperitoneal glands, with ascites. Anthrax bacilli were found in the blood and in the peritoneal exudate, but were particularly abundant in the lymphatics, where they seemed to have multiplied, entering the blood in comparatively small numbers.

DISEASES OF THE PERITONEUM.

Witthauer[4] reports 2 cases of **subphrenic abscess** due to perforation of gastric ulcers. In both the patients had suffered with gastric symptoms for some time, when sudden pain, weakness, and collapse developed. The cases presented no unusual features.

Robinson[5] in a study of **local peritonitis** points out that this is of

[1] Berl. klin. Woch., No. 44, 1895.
[2] Brit. Med. Jour., No. 1824, 1895.
[3] Ziegler's Beiträge z. Path. Anat., Bd. xvi. H. 2.
[4] Therap. Monats., Oct., 1895.
[5] N. Y. Med. Jour., Jan. 25, 1896.

extreme frequency, and that rarely is there entire absence of evidence of such an occurrence in some part of the peritoneum of adults. It occurs especially at the fixed flexures of the bowel, and leads to adhesions which may prove serious. In certain parts, as about the cecum and appendix or the gall-bladder, adhesions are extremely common and often innocuous. The explanation of chronic local peritonitis is infection following abrasions of the mucosa, aided by trauma due to muscular action in a bowel containing pathogenic microorganisms.

Shattuck[1] presented in clinic a case of a man who had suffered from pleural effusion, tubercular ostitis, lymphadenitis, and peritonitis. Complete recovery occurred after tapping the sacculated peritoneal effusion, and had persisted for 6 years.

Abdominal Tumors.—Pagenstecher[2] refers to **mesenteric cysts.** These may be either dermoid, chylous cysts, or productions of the caseation of mesenteric glands. He refers to 2 cases—one a chylous cyst, the other probably derived from a mesenteric gland. In 1 case movable kidney was simulated, and was suspected for a long time.

Nothnagel[3] considers the movability of abdominal tumors, calling attention to the great difficulty of diagnosis and the need of personal experience. Four elements must be considered in the question of movability: 1. The respiratory movements of the diaphragm; 2. Peristaltic movements of the stomach and intestines; 3. Pressure from without; 4. The weight of the mass. 1. Tumors of the liver, spleen, stomach, and to a certain extent of the kidneys, move with the respirations. A distinction between hepatic and gastric tumors may be possible when the tumor can be held back during expiration, this indicating the stomach as the seat. Respiratory movement of tumors is absent when the diaphragm is motionless, as in pleurisy and emphysema; also when the tumor has become adherent or when the liver and spleen are so large as to interfere with the movement of the tumor. The moderate movability of renal tumors is occasionally useful as a distinction from retroperitoneal tumors. 2. Tumors of the stomach and intestines may have movement due to peristalsis. Great movability on palpation may indicate a dislocated organ or a tumor of the intestines. This is an important point in distinguishing between a tumor of the bowel and a perityphlitic abscess. Among the fixed tumors are abscesses, sacculated exudates, aneurysms, tumors of the pancreas, of the retroperitoneal gland, of the bones, and of the undescended testicle. Movements of the tumors due to their own weight may cause considerable dislocation, particularly in tumors of the stomach.

Levi[4] reports 2 cases of hepatic disease, in 1 of which somnolence was constantly present during the early stages of a cirrhosis, and in the other intermittent narcolepsy occurred in relation to cholelithiasis.

[1] Internat. Med. Mag., Oct., 1895. [2] Berl. klin. Woch., No. 42, 1895.
[3] Festsch. z. 100 Jähr. Stiftungsfeier des Med.-Chir., Fried. Wilhelm's Institut.
[4] Arch. gén. de Méd., Jan., 1896.

DISEASES OF THE LIVER.

Jaundice.—Plowright[1] refers to the epidemic prevalence of catarrhal jaundice in King's Lynn during the later months of 1895. In all, 34 cases occurred in his own and in his colleagues' practice. Of these, ½ occurred in young persons—that is, under 20 years. The majority of the cases occurred in females. The degree of prevalence may be seen from the fact that but 25 cases of typhoid fever occurred in the same district. During the same time 25 of the 34 cases occurred in October and November. Malaise was sometimes present, and as often absent from the prodromal period of the disease. Vomiting was a frequent symptom. Most cases were well in 10 days; none died. [We have been struck by the frequency of mild jaundice occurring during the winter and spring months of the last several years, and have been disposed to attribute it to the prevalence of influenza. Gastrointestinal forms of this disease and intestinal complications have been more abundant than previously, and in equal measure jaundice has appeared to increase in frequency.]

Banti[2] records a case of jaundice which from the symptoms (headache, fever, chill, and absence of appetite, with swelling of liver and spleen and slight icterus) presented the appearances of an infection. Gastrointestinal symptoms, with the exception of loss of appetite, were completely wanting. The blood of the spleen extracted during life with every care to prevent contamination showed a capsulated bacillus, which resembled the bacillus of rhinoscleroma and capsulated forms of proteus and was evidently a distinct species. The author believes this to have been the specific cause of the jaundice in his case.

Neumann[3] considers the question of **jaundice in association with syphilis,** and refers to the following points as indicating a close relationship between the two conditions, rather than an accidental complication: 1. When the jaundice begins without gastric disturbances, and especially when there is simultaneously a skin-eruption; 2. When relapses of the jaundice occur with relapses of the eruption; 3. When there is tenderness over the liver or swelling of the same coincident with the eruption; 4. When the antispecific treatment causes disappearance of the jaundice; 5. When there are evidences of other syphilitic intestinal diseases coincident with icterus. The author refers briefly to 13 cases of icterus in recent syphilis, 9 of the patients being women and 4 men. In 10 there were no gastrointestinal disturbances, while in 1 there were gastric troubles in the later stages. In another the symptoms of gastrointestinal catarrh existed at the onset. The latter was enlarged in 1 case, and in another it was somewhat decreased in size. In 8 cases the jaundice appeared simultaneously with the eruption, in 3 later and 2 earlier. In 1 case the jaundice relapsed and recurred twice, with simultaneous occurrence of exanthema. In 4 of the cases the first eruption was accompanied by icterus; in 9 the latter occurred with recurrences of eruption. Antispecific treatment was

[1] Brit. Med. Jour., May 30, 1896. [2] Deutsch. med. Woch., No. 31, 1895.
[3] Wien. med. Presse, No. 45, 1895.

followed by relapse in 12 cases; 1 patient died. The latter was an instance in which the disease had existed 8 months and which had been treated by subcutaneous injections. In the later stages delirium, convulsions, and coma developed and ecchymoses were seen upon the surface. The autopsy showed parenchymatous nephritis, cystitis, and pyelitis. The liver was small, and presented on its surface elevations which on section were found to be enlarged lobules. The microscopic examination showed regeneration of the liver cells in adenomatous form secondary to degeneration of the liver.

Boisson[1] reports 3 cases of jaundice, in all of which it was impossible to find any trace of bile-pigments in the blood or urine, and in which he concludes that the coloration was due to destruction of the corpuscles in the circulation. [Stronger proof must be furnished in support of this view. Recent investigators are nearly all in accord that true hematogenous jaundice never occurs.]

Kester[2] reports the case of a boy, aged 3, who had been jaundiced for 2 years before he came under observation with chronic pneumonia of the right lung. The jaundice disappeared, but the boy died, and at autopsy the chronic pneumonia was found to be tubercular. The cause of the jaundice was discovered to be pressure of large **glands in the fissure of the liver.** The liver was about normal in size, but tubercles were scattered throughout the substance and the ducts were dilated. A perforation of the common duct was found at the lower end, communicating with a cavity containing caseous material.

Knight[3] reports a similar case of jaundice in a child of 6 years. The patient quickly recovered from a first slight attack associated with enlargement of the liver, but a month later jaundice reappeared, and the liver was still smooth and not sensitive. In a short time his eyesight became imperfect; the boy grew drowsy, and the liver diminished in size. The urine contained a trace of albumin and bile-pigment, but no leucin or tyrosin. Later he had convulsive attacks attended by screaming and pain in the back. The liver was found to be retracted, small, and pale. Microscopically, tuberculous lymphatic enlargements were found in the portal fissure. The spinal cord was not examined. [We have recently observed 2 cases of gastric carcinoma in which persistent jaundice was caused by the pressure of enlarged lymphatic glands in the fissure of the liver. Cases of this kind are not unusual. Tuberculous disease of the glands leading to jaundice, however, is less frequently observed.]

Joffroy[4] reports a case of an individual of alcoholic habits who was suddenly seized with difficulty in walking and an apoplectiform seizure. After this, general apathy and disturbance of the movements of the lips and tongue, with slow speech, developed. Fibrillary tremor of the tongue and lips was absent. The pupils were regular. Urobilin was found in the urine, and the general condition of the patient greatly improved. Subsequently a relapse occurred, and at the same time grave icterus developed and the patient died.

[1] Gaz. Hebdom. de Méd. et de Chir., Apr. 5, 1896.

[2] Centralbl. f. innere Med., 1896, p. 213.

[3] Quart. Med. Jour., July, 1895.

[4] Gaz. méd. de Paris, Jan. 18, 1896.

The hepatic nature of the affection was thus established, and general paralysis was excluded.

CIRRHOSIS.

Etiology.—Arthur Foxwell[1] calls attention to the fact that **alcoholic cirrhosis** of the liver not infrequently leads to enlargement of that organ, and points out that clinicians usually overlook this fact. In his own experience he distinguishes 4 groups of cases: in the 1st, in which ascites did not appear, and which were relieved by treatment, 26 of 28 cases presented enlargement of the liver, the edge being found on an average $2\frac{1}{4}$ in. below the ribs. Some of these were cases of long standing alcoholism. In the 2d class, in which ascites had occurred, but in which treatment had relieved the symptoms, 9 at least of 18 presented enlargement, while in several no report of the size of the organ is made. In the 3d class, which included fatal cases without postmortem examination, the edge was far below the ribs in 9 of 12, and taking the 12 cases together the liver extended on an average $2\frac{1}{4}$ in. below the ribs. In the 4th class, consisting of fatal cases where postmortem examination was made, there were 8 cases, 3 of which were women and 5 men. In the former 3 the average weight of the organ was $48\frac{2}{3}$ oz. against the normal weight of 45 oz.; in the 5 males the average weight was 64 oz. against the normal 53. Taking all the cases together, it is seen that the liver was actually far below the ribs in 46 cases, and taking all together the average extent of cirrhotic liver below the ribs was $1\frac{6}{11}$ in. His studies further showed that the enlargement did not depend upon fatty infiltration, and beer-drinking seems less likely to produce enlargement than the drinking of raw spirits.

Parker[2] records a case of extreme hepatic cirrhosis **in a boy of 12.** Diarrhea, jaundice, ascites, hematemesis, and melena were prominent symptoms. Treatment was without effect, and he died. The autopsy revealed a hob-nail liver one-third the normal size, and an enlarged spleen. There was inflammation of the cecum and colon. No cause could be discovered, but the child's father was a moderate rum-drinker for a year or two before the child's birth.

Pick[3] in an article on **pericarditic pseudocirrhosis** of the liver calls attention to enlargement of the liver with ascites, but without jaundice, as a symptom sometimes found to be due to latent pericarditis. The latter causes disturbance in the circulation of the liver, leading to connective tissue overgrowth and to intense ascites through congestion of the portal circulation. It is especially common in early life, though it occurs in old age, and is distinguishable from ordinary cirrhosis by the absence of alcoholism and similar causes, by the history of pericarditis, and the existence of primary edema of the legs.

Weber[4] reports a case of cirrhosis of the liver characterized by jaundice of 4 years' duration. At the autopsy the liver weighed 54 ounces. Its substance was tough, its surface puckered or granular, and its color greenish.

[1] Brit. Med. Jour., Feb. 15, 1896.
[2] Ibid., Feb. 22, 1896.
[3] Zeit. f. klin. Med., Bd. xxix. p. 385.
[4] Brit. Med. Jour., Apr. 25, 1896.

The common bile duct was considerably distended, and near its orifice under the duodenum were two black gall-stones, the larger one about as large as a cherry-stone. Some of the contents of the gall-bladder could be squeezed into the duodenum. The spleen was greatly enlarged. Weber inclines to the belief that cirrhosis was produced by the constant irritation of the back flow of the bile, the gall-stones in the common bile duct acting as a ball valve and preventing its escape into the duodenum.

Symptoms.—Preble[1] reports 4 cases of fatal **gastrointestinal hemorrhage** due to cirrhosis of the liver. In all of these cases there were varicose veins in the lower part of the œsophagus. In the 1st case the point of rupture was not found; in the 2d and 4th a rupture was found in one of the dilated œsophageal veins. In the 3d an œsophageal ulcer had perforated the venous wall. Gauthier[2] calls attention to the fact that gastrointestinal hemorrhage may precede the other symptoms of cirrhosis of the liver, by a considerable period in certain cases. There may be no premonitory symptoms, while in other cases headache, depression, and symptoms resembling those of a specific fever may occur. Usually the hemorrhage is severe and sudden; it may prove fatal or it may cease, leaving no subsequent symptoms. It is especially in the atrophic form of cirrhosis that hemorrhages occur, and the author ascribes to toxic substances which act upon the nervous system and dilate the blood-vessels an important part in the etiology. Monnier[3] records a case of alcoholic cirrhosis of the liver in which a **papular eruption** becoming vesicular, and finally hemorrhagic, appeared upon the skin just before death. Cultures showed the Bacillus coli communis and a streptococcus. Oestreich[4] calls attention to the fact that the **splenic enlargement** in cirrhosis of the liver may be out of proportion to the amount of obstruction in the portal circulation. The remaining parts of this circulation may present little congestion, though the spleen is very much enlarged. His investigations showed that the spleen presented evidences of active proliferation, and he concludes that the enlargement is due to irritation by alcohol or other poisons. The thickening of the capsule occurs coincidently and is brought about in a similar manner by irritation. Kirikow,[5] in examining the **gastric functions** of 6 cases of hypertrophic cirrhosis of the liver with jaundice, found that the total acidity is generally diminished, as is also the total HCl, while free HCl is largely diminished or even absent. The digestive functions are in general much enfeebled or quite abolished. Eichberg[6] reports a case of hypertrophic cirrhosis occurring in a young woman of 20. Icterus existed for 2 years before death, and just before the fatal termination there were aphasia and slight hemiplegia, followed by delirium, stupor, and coma. The liver presented the typical appearance of biliary hypertrophic cirrhosis.

Treatment.—Klemperer[7] recommends urea as a diuretic in cases of

[1] Chicago Med. Recorder, Dec., 1895.
[2] Jour. de Méd., Mar. 10, 1896.
[3] Compt. rend. de la Soc. de Biol.
[4] Virchow's Arch., Bd. cxlii., H. 2.
[5] Arch. gén. de Méd., Sept., 1895.
[6] Med. News, Apr. 11, 1896.
[7] Berl. klin. Woch., Jan. 6, 1896.

cirrhosis of the liver. He does not find early tapping so useful as has been claimed, but, on the contrary, he has seen bad results in several cases. He administers 10 g. to 15 or 20 g. in the 24 hours, and continues the treatment for 2 or 3 weeks. The unpleasant taste is obviated by drinking milk immediately after the medicine has been taken. The remedy is specially useful in the early stages while the kidneys are in good condition, and he illustrates its activity by stating the quantity of urine excreted by cases before and after administration of the remedy. Pütz[1] reports a case of ascites in which the abdomen was tapped 47 times during 4 years, and in all nearly 1200 liters of liquid, or about 7 times the weight of the patient, were removed.

Abscesses.—Lannois[2] reports a case of abscess of the liver due to **pylephlebitis** following typhoid fever. He refers to the statistics of Schultz, who found no instances among 3686 patients, with 362 fatal cases; of Romberg, who saw 1 among 677 cases, with 88 deaths; and of Dopfer, who saw 10 in 927 autopsies. He himself found this 1 in 71 autopsies. There was no cause for metastatic abscess nor any typhoid ulceration of the biliary passages or gall-bladder. The abscess was due to ascending thrombosis beginning in the intestines, and the bacillus of Eberth was found in the abscess. The complication occurred during the fourth to fifth week, and the clinical symptoms resembled those of peritonitis. Schweiger[3] reports 8 cases of abscess of the liver in addition to 10 reported last year. Among the 18 there were 16 men and 2 women, and an unusual proportion was associated with dysentery (16 of the 18). In none of the cases of dysentery did he find amebæ, but the *Megastoma entericum* was found in 2. The pus of the abscess was also free of amebæ.

Wicklein[4] records a case of abscess of the liver in which a capsulated bacillus (B. capsulatus, Pfeiffer(?)) was discovered. There were 2 abscesses in the liver and perforation into the lung, with chronic suppurative cholecystitis, perforation into the peritoneum, and peritonitis. It is likely that the bacillus entered the liver through the biliary passages. Kuhn[5] reports a case of abscess of the liver which resulted from perforation of the wall of the stomach and secondary penetration of the wall of the superior mesenteric vein by a cocoa palm fiber. This had occasioned an ascending phlebitis extending to the liver.

Acute Yellow Atrophy.—Voorhees[6] reports a case of acute yellow atrophy of the liver occurring in a farmer previously healthy. At the autopsy the liver was about one half the natural size and very soft. Two severe attacks of gonorrhea are suggested as being etiologically related to the morbid process. Richter[7] reports a case of acute yellow atrophy following syphilitic infection. For the last 14 days of life daily examinations were made of the

[1] Deutsch. med. Woch., Feb. 20, 1896.
[2] Rev. de Méd., Nov., 1895.
[3] Wien. med. Presse, No. 47–49, 1895.
[4] Centralbl. f. Bakt. und Parasit., Bd. xviii. H. 14, 15.
[5] Centralbl. f. innere Med., No. 19, 1895.
[6] Med. Rec., Apr. 18, 1896.
[7] Berl. klin. Woch., No. 21, 1896.

urine to determine the amount of urea, ammonium, the alloxin bodies, and the uric acid excreted. The total quantity of nitrogen remained almost constant. The urea was perfectly normal in amount until the last 2 days, when, during the existence of severe coma, there was a moderate reduction. The ammonium was slightly increased, but hardly enough to be supposed to be the result of insufficiency of the hepatic cells and consequent imperfect formation of urea. Richter prefers to believe that it was the result of the excessive production of acids, such as might easily occur in acute yellow atrophy of the liver from degeneration of the albumin of the organs. This is the probable explanation in the present case, because the alkalinity of the blood, carefully triturated according to the method of Löwy, only equalled 212 minims of sodium hydroxid. Uric acid and the alloxins showed both a relative and absolute increase, but the amount excreted was subject to considerable daily variation. The amount of ingested nitrogen equalled about $3\frac{1}{2}$ g. a day, and, as the average excreted was nearly 3 times this, it gives an indication of the amount of albumin-destruction. A second case also occurred at the clinic, and was examined for 5 days during the course of the disease, examination ceasing 3 days before death. The patient was a young woman who had acquired syphilis 6 months previously. The results were identical with those of the first case studied. Richter believes that the theory that the coma in acute yellow atrophy is due to inadequate formation of urea is necessarily false, for in the first case coma occurred before any reduction whatever in the daily excretion of urea had occurred. He further believes that we can no longer hold that urea is formed exclusively or even chiefly in the liver, or that if we do consider that it is thus formed, then we must believe that, as the liver is destroyed, the parenchyma of other organs is capable of taking on this function and adequately performing it.

Aufrecht[1] reports a case of acute atrophy of the liver occurring in sclerema neonatorum. 24 hours after birth the child presented slight swelling of the feet, which increased so that in the next 48 hours it had occupied a considerable part of the lower half of the body. The skin was hard and doughy, but pitted slightly on pressure. Cyanosis developed, and later jaundice, and in addition small punctate hemorrhages were seen in the skin. The child died, and at the autopsy the liver was found to be small, weighing 100 g. On section it presented a dark reddish bluish appearance, and the acini could not be distinguished. On microscopic examination the liver-cells showed evidence of marked degeneration (coagulation necrosis and vacuolization) and were irregularly distributed, showing no evidence of the normal columnar arrangement. Hemorrhages were abundant, and small bacilli (possibly *Bacillus coli communis*) were observed in the stained sections.

Echinococcus Cysts.—Page[2] reports a case of hydatid cysts of the liver and of numerous other organs and portions of the body. There was a right-sided empyema, multilocular cysts of the liver, cysts of the peritoneum, omentum, and mesentery, with adhesions of the intestines. The bladder con-

[1] Centralbl. f. innere Med., Mar. 14, 1896. [2] Med. Rec., Sept. 21, 1895.

tained 6 to 8 small cysts, and in these, as in the liquid of all of the other parts, hooklets were detected. Cardarelli[1] discusses the difficulty of diagnosis between echinococcus cyst of the liver pointing upward and pleurisy with effusion. The complete absence of breath-sounds and the occurrence of pains beneath the shoulder-blade are significant points. In pleurisy the heart is pushed to the left, in hydatid cysts to the left and upward. Sometimes an elastic resistance may be felt and fluctuation occasionally occurs. He warns against exploratory aspiration excepting under the strictest precautions.

Malformations.—McPhedran[2] reports 7 cases in which a tumor was present in the right hypochondriac region; 5 of these cases occurred in women, 1 in a man, and 1 in an infant of 11 months. In 4 of the cases complications occurred, and celiotomy was performed for the purpose of exploring the mass. In every instance this was found to be an accessory lobe of the liver. The most interesting was that of the child, which had had symptoms of severe intestinal irritation which was found at the autopsy to be due to hemorrhagic pancreatitis. In this case the lobe of the liver was about the size of a finger, and extended downward on the right side.

Mester[3] reports a case of **aneurysm of the hepatic artery** occurring in a man who had been kicked in the abdomen by a horse. This had been followed by pain in the hypochondrium, intermittent jaundice, vomiting, and the passage of fresh or altered blood by the rectum. The patient died, and at autopsy a false aneurysm of the right branch of the hepatic artery was found within the liver. It communicated with one of the hepatic ducts. He has collected 19 cases from the literature, which showed that the diagnosis is never made during life, the condition being mistaken for ulcer of the duodenum (as in his case) or for gall-stones.

Gall-stone.—Hanot and Letienne[4] divide biliary calculi into microbic and nonmicrobic. The former when fresh occur in irregular raspberry-like masses, apparently constituted of numerous elementary concretions, closely resembling dried bread-crumbs, and their crystalline arrangement is not regular. Their color is usually pale. The old concretions of microbic origin resemble the descriptions of gall-stones usually given. The calculi of nonmicrobic origin are only found in cases of obstruction of the common duct due to pressure from without. They are very regular in form and show numerous indentations of their surface, containing yellow bile-pigment and contrasting with the black color of the stone itself. The microorganism concerned in the formation of microbic stones is almost invariably the bacillus coli communis.

Fenger[5] in an interesting paper upon the **surgical treatment of gall-stones** points out certain features of interest in the symptomatology and diagnosis. The pain, he finds, is seldom located in the region of the gall-bladder or in the right hypochondrium when the stone is lodged in the com-

[1] Giorn. Internaz. delle Scienze Med., Feb. 29, 1896. [2] Canad. Pract., June, 1896.
[3] Zeit. f. klin. Med., Bd. xviii. p. 93. [4] Compt. rend. de la Soc. de Biol., Dec. 27, 1895.
[5] Am. Jour. Med. Sci., Mar., 1896.

mon duct, unless coincident inflammation of the gall-bladder is present. Very frequently he finds the pain in the epigastrium, and not rarely in the back. He regards the localization of the pain away from the gall-bladder as characteristic of floating stone. Remittance of pain with sudden subsidence, attended with flow of bile and without discharge of stone, signifies a single stone or a few stones floating in the dilated common duct. Change of position causing a relief of pain is a further evidence of floating stones. Regarding biliary fever, he believes that the possibility of this being due to absorption of aseptic bile cannot be denied, and cites 1 of his cases in which the attacks of retention were always accompanied by fever, and yet the bile in the common duct was sterile. [The ball-valve action of a gall-stone in a dilated duct was described by Osler a number of years ago.]

Levi[1] calls attention to **somnolence and narcolepsy** as a result of diseases of the liver, and he reports 2 cases showing this relation. In one somnolence was constantly present during the early stages of cirrhosis of the liver. The patient was taken with attacks of sleepiness, and would sleep all day on holidays, only waking for his meals, and had difficulty keeping awake at all, often going asleep at his work. In the second case the individual suffering with hepatic colic had attacks of intense drowsiness, while between attacks of colic she was perfectly wakeful.

Moss[2] reports a case of biliary colic with the expulsion of 3 stones at intervals. As fever of tertian type had occurred, the system had been saturated with quinin, and he regarded this as an important factor in aiding the expulsion.

Pariser[3] contributes a paper on **nervous biliary colic,** 7 such cases having come under his observation in the last 3 years. He holds that it is an uncommon affection, though many cases are looked upon as instances of gall-stone, and thus make it apparently rare. Fürbringer called attention to the fact that the pain in this condition is localized to the liver, while in gall-stones it radiates to a distance. Pariser further points out that the attack is usually short, though it may last for several hours, and that vomiting and jaundice may sometimes occur at the end of the attack. The nature of the disease is hysterical or neurasthenic, and the treatment should be conducted with this nature in view.

Turnbull[4] advocates the use of **nitroglycerin** in biliary colic, and reports a case in which it produced permanent relief.

Kelynack[5] refers to the relation of gall-stones to primary cancer of the gall-bladder. He states that gall-stones occur in 6 to 10% of all cases coming to autopsy, and that the female sex is four times as liable to it as the male. Regarding the theories which have been devised in explanation of the occurrence of gall-stones in association with cancer of the gall-bladder, he holds that the view that the association is accidental cannot be maintained. It is

[1] Arch. gén. de Méd., Jan., 1896.
[2] Jour. Am. Med. Assoc., Apr. 18, 1896.
[3] Centralbl. f. innere Med., Apr. 25, 1896.
[4] Lancet, Feb. 6, 1896.
[5] Practitioner, Apr., 1896.

possible, on the other hand, that the tumor may furnish conditions favorable to the formation of a stone; but the author inclines more strongly to the third theory, that the gall-stones exercise a local irritation eventuating in cancer-formation. At all events, the presence of stone does favor the development of cancer in predisposed individuals.

DISEASES OF THE PANCREAS.

Thayer[1] reports a case of **acute pancreatitis** with secondary **parapancreatic abscess** and disseminated fat-necrosis. The patient, a man of 34, had been a regular drinker of beer and whiskey, and had latterly suffered with attacks of nervous dread, and for about 2 years with morning nausea, vomiting of greenish matter, and abdominal cramps. On admission to the hospital there was found a deep-seated tumor in the epigastrium, covered by tympany and not moving with respirations. The urine was free of albumin and sugar, and there was slight leukocytosis. The temperature was elevated, and the patient's general condition was one of depression and mental confusion. Operation was performed and the patient recovered. Considerable quantities of necrotic fat were discharged through the incision. The author reviews the more important literature bearing on the nature and peculiarities of fat-necrosis. Bonsdorf and Sievers[2] describe 2 cases of acute gangrenous pancreatitis in which the symptoms resembled those of acute intestinal obstruction. Areas of fat-necrosis were found in the glands of the mesentery, epiploic appendages, capsule of the kidney, and other parts. Ascitic liquid of brownish color, from admixture of altered blood, was found. Williams[3] reports a case of acute pancreatitis. The patient, after suffering with intestinal indigestion for a few days, was seized with violent abdominal cramps, which were followed by attacks of vomiting and associated with intense pain and violent frontal headache. The symptoms grew progressively worse; there were signs of heart-failure, and death occurred on the third day. At the autopsy acute pancreatitis, with degeneration of the cells and hemorrhages, was discovered. The omentum and mesentery were found discolored with spots of fat-necrosis. These areas had a homogeneous and finely granulated surface, and on examination with high power masses of needle-like crystals were found, corresponding to areas in which the fat-globules had changed into a granular substance.

Stockton and Williams[4] report 2 cases of **fat-necrosis.** The first case, a man of 59, had suffered with extreme fatigue, flatulence, and depression. The urine contained no albumin or sugar. Suddenly, after a chill followed by a hearty meal, he was seized with vomiting, retention of urine, and pain and tenderness in the abdomen. There were great thirst and slight fever. He improved slightly and returned from Europe, where he had become ill. Soon after his arrival prostration and the appearances of toxemia developed, and he died in coma a few days later. Albumin had been found in the urine

[1] Am. Jour. Med. Sci., Oct., 1895.

[2] Finska. la Karesallskapeto. Handlingar., Bd. 36, 1895.

[3] Chicago Med. Recorder, Jan., 1896.

[4] Am. Jour. Med. Sci., Sept., 1895.

once, but was subsequently absent. There was no sugar. In the second case a man of 39 was taken ill while at work with pain and nausea; fever developed and the patient was slightly jaundiced. The urine was negative, and there were great tenderness and distention of the stomach, great thirst, and occasional vomiting. Rapid death ensued. In both cases there was marked fat-necrosis in the fat of the omentum and other parts of the abdomen. The pancreas in the first was slightly if at all diseased, though the epithelium of the ducts and of the substances in places refused nuclear stains. In the second case there was round-cell infiltration, hemorrhagic exudation, and considerable increase of interstitial connective tissue.

Chronic Pancreatitis.—Riedel[1] reports 3 interesting cases of disease of the head of the pancreas, in which the condition was due to gall-stones, and the head of the pancreas was converted into a tumor of stony hardness. At the autopsy of one the condition was determined to be interstitial pancreatitis. One of the cases was at first mistaken for carcinoma, though the further history excluded cancer. In the second case the tumor was mistaken for the gall-bladder.

Harley[2] has studied the question of the absorption of various elements of the food in a case of **obstruction of the pancreatic duct,** and in dogs in which partial pancreatic extirpation had been practised. The patient referred to was a boy, who discharged fatty stools, and in whom the diagnosis of obstruction of the pancreatic duct could be made with considerable probability. The author found that only 26.29% of the fat of the ingested milk was absorbed and 60% of the nitrogen. These results correspond very accurately with those obtained in dogs, and in which a large part of the pancreas was removed by operation. It was noteworthy that in his experiments and in the patient the splitting up of fats occurred in the intestines.

Carcinoma.—Fothergill[3] reports a case of cancer of the head of the pancreas. There was absence of fatty stools, of jaundice, and of digestive disturbances. The positive symptoms were rapid emaciation, deep-seated pain and tenderness, and glycosuria. The tumor was found in the umbilical rather than the epigastric region.

Cochez[4] has studied the hepatic manifestations in cancer of the head of the pancreas, and calls attention to the fact that, despite chronic and progressive jaundice, the liver may not be enlarged and the gall-ducts may not be dilated. In this form of mechanical biliary cirrhosis of the liver the organ is first enlarged and subsequently contracted. When the gall-bladder is not obstructed, it acts as a reservoir, and a slow progress of the case with development of the atrophic stage is observed. When the gall-bladder is obstructed, the more rapid form appears and death in the hypertrophic stage of malignant jaundice occurs. [In the cases under our observation it has not been possible to establish sharply defined stages of hypertrophy and atrophy. Practically, all cases have been marked by enlargement of the liver.]

[1] Berl. klin. Woch., 1896, Nos. 1 and 2.
[2] Jour. Path. and Bact., 1895, p. 245.
[3] Brit. Med. Jour., May, 30, 1896.
[4] Rev. de Méd., No. 7, 1895.

DISORDERS OF THE URINARY SECRETION AND DISEASES OF THE KIDNEYS.

Disorders of the Urine.—Linossier[1] has carefully investigated the **digestive alkalinity** of the urine. He believes that to a certain extent it depends upon the amount of hydrochloric acid secreted by the stomach—that the secretion of the bile tends to diminish it, but that there are such a number of subsidiary factors acting that it is of no value as a symptom excepting when it can be determined that the biliary secretion is normal. If, then, the digestive alkalinity of the urine fails, it may be suspected that there is a hyperacidity of the stomach.

Mathieu and Tréheux[2] have investigated a number of cases to determine the relation between the **acidity of the stomach-secretion and of the urine,** and have found a rather close dependence of the latter upon the former. The greater the amount of acidity in the stomach as the result of hypersecretion of HCl or of fermentation and production of lactic or other acids, the greater the acidity of the urine. In some cases the natural reduction of acidity or alkalinity that succeeds a meal may be largely counterbalanced by the acid production within the stomach.

Armstrong[3] reports the case of a man of 74 who was admitted to the hospital suffering with **suppression of urine** for 8 days. Some twitching developed, and later rambling, dimness of vision, and inability to recognize his friends. These symptoms disappeared promptly with restoration of the secretion; 18 days later another attack occurred and proved fatal. Postmortem, carcinoma of the left kidney and ureter and a separate focus completely blocking the right ureter were found. Rininger[4] reports a case in which suppression of urine existed for 48 days in a girl of 18. The appetite and general condition remained good, excepting some sensitiveness in the renal region. Recovery followed faradization of the regions of the kidneys. [The author does not consider the existence of hysterical simulation in discussing the case.]

Roberts[5] records a case which presented severe lumbar pains extending into the thighs, depression and languor, with loss of flesh. There were constipation, pain on micturition, and a voracious appetite. The only evidence of disease was extreme phosphaturia. The patient recovered completely upon acid treatment.

Dupray, Cazin, and Savoire[6] have studied 15 cases of carcinoma to determine the value of **Rommelaere's sign.** According to this, diminution of the normal NP_2O_5 and NaCl is pathognomonic. The authors find that the test is an indication cachexia, but that with suitable nourishment it disappears.

Eichhorst[7] reports the case of a boy of 10 years who suffered with urinary symptoms during an attack of cholera morbus, and finally passed large numbers

[1] Gaz. Hebdom. de Méd. et de Chir., Apr. 16, 1896.
[2] Arch. gén. de Méd., Nov., 1895.
[3] Brit. Med. Jour., Apr. 18, 1896.
[4] Med. Age, Sept. 10, 1895.
[5] Brit. Med. Jour., Feb. 8, 1896.
[6] Arch. gén. de Méd., July, 1895.
[7] Deutsch. med. Woch., No. 4818, 1896.

of small round or elongated **calculi** composed of **uric acid,** together with bloody urine. He points out that disturbances of the stomach and intestines are prone, in children, to lead to increased uric-acid secretions. Cases, however, in which actual calculi have occurred have not been described.

V. Noorden[1] contributes a most interesting paper on the **treatment of uric-acid concretions** in the kidneys. Four indications are presented: 1. The administration of considerable liquid; 2. The use of a diet which shall produce uric acid in a minimum amount; 3. The administration of substances which will render the urine more solvent to uric acid; 4. The avoidance of substances which reduce the solvent power of the urine. Regarding the diet, the author holds that in actual practice it is scarcely possible to carry out a plan which will bring about the desired results. To fulfill the third indication, sodium and lithium salts, urea, piperazin, and other substances may be used; and for the fourth point he advises care in the use of strong mineral acids. Particularizing upon the alkaline treatment, he holds that it is difficult to maintain an alkaline reaction of the urine for any length of time, and that it is sufficient to procure a moderately weak acid reaction. This removes the monophosphate of sodium, which in particular renders the urine insolvent, while the biphosphate of sodium remains and is actively solvent. Finally, the author recommends the administration of carbonate of calcium or the vegetable salts of calcium instead of sodium and lithium salts. This treatment causes the removal of phosphates through the intestines, and thus relieves the urine. He has used this treatment in 21 cases with excellent results. There were only 2 attacks in the 9 months during which the treatment was used among these cases, whereas some of the cases had been having attacks every few weeks. He uses from 2 to 4 g. of calcium carbonate a day, but in some cases as much as 10 g. is necessary to remove the monophosphate of sodium from the urine. Smaller quantities of the soluble vegetable salts suffice.

De Dominicis[2] discusses the subject of **oxaluria** thoroughly. According to him, the most frequent symptoms are constipation and dyspepsia; besides these there occur palpitation, irritation, malaise, hypochondria, or melancholy disposition, loss of self-confidence, impotence, easily acquired fatigue, apathy, anxiety, and perhaps suicidal tendencies; with these are associated progressive emaciation, and sometimes changes in the skin, such as eczema, loss of hair, and frequently there are hemorrhages from the intestines, kidneys, or lungs. Experimentally, he produces oxaluria in dogs by extirpation of the thyroid gland. Clinically, he finds it is associated with functional disturbances of the stomach, varying with the various phases of the disease. An exclusive diet of meat causes it to disappear completely. Severe functional disturbances of the stomach, however, as they occur in influenza, rarely cause oxaluria. He considers oxaluria as a symptom of the same value as glycosuria and having many analogies with the latter. The disease which has been described under the head of oxaluria is practically the modern neurasthenia. He holds that the cause is probably the action of some toxin.

[1] Centralbl. f. innere Med., Apr. 25, 1896. [2] Wien. med. Woch., Apr. 25, 1896.

Kisch[1] speaks of the necessity of an exact quantitative determination of the oxalic acid excreted with the urine. He reports 7 cases out of 34 examined in which the quantity of oxalic acid exceeded 20 mg. per liter, and was therefore considered pathologic. In all these cases the specific gravity of the urine was very high, ranging from 1026 to 1041. In 5 of the cases the amount of indican was increased, and in 3 sugar was present. In all there was considerable disturbance in the functions of the digestive organs, particularly habitual constipation. In 4 of the cases there was extreme excitability of the nervous system. He considers oxaluria as a symptom of various alterations of tissue-metamorphosis, particularly associated with disturbances of the nervous system and the organs of digestion. The systematic use of alkaline, saline, and mineral waters produced diminution of the oxalic acid in the urine.

Pfeiffer[2] speaks in high terms of the value of **Cantani's diet in oxaluria.** He reports 2 cases in which extraordinary reduction in the amount of oxalic acid took place after its employment. He also reports 6 cases which were treated with baths according to the Wiesbaden method. All these cases showed a very marked diminution of the total secretion of oxalates, although in 1 case this diminution was only evident 3 weeks after cessation of the cure. The effect of the treatment seems to last for a considerable time, 1 case having been examined 3 years after the cure and found normal.

Neumann[3] found in a case of cardiac disease in which diuretin was beginning to produce increase of the urine that sugar occurred in the latter. He refers to the recent discovery of Jacoby that **glycosuria** occurs in the urine in certain kidney-affections when diuretics have begun to act.

Rosenfeld[4] has studied the occurrence and significance of **acetone** and **diacetic acid** in the urine. Physiologic acetonuria occurs in healthy individuals who are fasting, or in small quantities even when taking a mixed diet. Slight increase of the albuminous food increases the acetone, while large quantities do not markedly increase it. Marked acetonuria from an excessive meat diet can be made to disappear after one or two carbohydrate meals, as can also that produced by fasting, the acetone being better oxidized. It would appear that acetonuria is the result of moderate albuminous decomposition, and the indispensable condition is the abeyance of carbohydrate metabolism. In diabetes acetonuria appears after the beginning of a proteid diet or a mixed diet, and is accompanied by diacetic acid. If the diabetic excrete acetone in large amounts while carbohydrate food is supplied, it is pathological. Two clinical facts are that diabetic coma never occurs without acetonuria, and that after the commencement of a proteid diet acetonuria on the one hand and coma on the other may occur. Reduction of acetone may be secured by carbohydrate feeding, by excessive proteid food, and by hunger. In a very ill case the smallest amount of albuminous matters and a rich carbohydrate supply form a most practical

[1] Centralbl. f. d. Krankh. d. Harn u. Sex.-Org., vol. vii. Heft 4.
[2] Ibid., vol. vi. Heft 6.
[3] Arch. f. exper. Path. und Pharmacol., Bd. 36, H. 1, 2.
[4] Centralbl. f. innere Med., Dec. 21, 1895.

diet. Giving glycerol, levulose, and cane sugar, with albuminous food, a relatively small amount of acetone was obtained, and he has been able to reduce acetone from 7½ to 2 g. Twice he has been able to avert commencing coma.

Hirschfeld[1] again reviews the subject of **acetonuria,** referring particularly to his previous papers, published in 1893 and last year. He showed that the addition to the diet of small quantities of carbohydrates suffices to check the excretion of acetone, though the latter had been abundantly present when the diet was purely albuminous. This is not due to any conservative influence of the carbohydrates leading to a lessened destruction of albumin, since appropriate quantities of fat serve the same purpose of preservation of albumins, and yet do not check the developments of acetonuria. The author concludes that acetonuria is closely related in some way with the metabolism of carbohydrates. Regarding the significance of the condition, he holds that pathologic acetonuria occurs only in diabetes. In this disease, despite rich carbohydrate diet, the excretion of acetone continues, sometimes amounting to considerably over 1 g. in 24 hours, whereas in health there is never more than about 0.9 g. Palma[2] has investigated the excretion of acetone and its relation to albuminous metabolism. He found that in every case of acetonuria excessive consumption of albumin could be determined, but there is no fixed quantitative relationship.

Freund[3] supports the view recently revived by Semmola, that **albuminuria** in Bright's disease results from **alterations of the blood** itself. He found that the relation of serumalbumin to serumglobulin was as 1 to 2 or 3 in Bright's disease, instead of as 1 to 1.5 as it occurs in health. In other diseases, and especially in congestion of the kidney, the relation was normal. In 1 case of pernicious anemia, however, the same excess of globulin was discovered. In studying coagulation of the blood-serum in Bright's disease he found that a temperature of 76° C. was necessary, instead of one of 70° or 74°, and the clot was never firm. Finally, he showed that the albumin of the serum in nephritis is abnormally capable of dialysis. In 15 of 17 cases the liquid which had passed through the dialyzer contained from 0.006 to 0.025% of albumin, while in other diseases none, or at least only the merest traces, pass through. [These views of Semmola and Freund are attractive, but want further confirmation.]

Marie[4] reports a case of **cyclic albuminuria** and discusses the subject. He defines the disease as a form of albuminuria occurring in apparently healthy persons, intermittent in its course and subject to certain conditions. It must be distinguished from transitory albuminuria, which may occur in healthy persons at times. The cardinal condition is that albumin is present only when the upright position is assumed, and vanishes on lying or sitting down, even though hard work is done in this position. The quantity is always small, and its composition varies in different cases and at different times. Nucleo-albumin, serum albumin, pepton, propepton, etc. have been

[1] Centralbl. f. innere Med., June, 1896.
[2] Zeit. f. Heilk., Bd. xvi. p. 463.
[3] Wien. klin. Rund., No. 4, 1895.
[4] Sem. méd., Feb. 5, 1896.

found. The quantity of urine is not much affected. As to the nature of the condition, the author believes it a special disease, probably due to perverted function of the sympathetic nerves. He does not believe it is dependent upon a minimal organic lesion of the kidney. Casts may be found, but these do not necessarily indicate renal disease.

Prestiqs[1] reports an interesting case of **albuminuria** which was observed for 7 years in a patient otherwise in excellent health. Careful physical examination showed all the organs to be normal and functionally active. The urine varied in quantity, but in general was rather above the normal amount. The urea reached 48 g. a day. The other constituents were normal in quantity. Albumin, however, was invariably present, the lowest quantity being 1 g. in a day, and the highest 5.60 g. Usually the amount varied between 4 and 5 g. and corresponded to the quantity of urine, but the proportion was not always maintained. It is particularly noted that the heart showed no alteration in its action, and that there was never any edema.

Matthes[2] has studied the urine of a case of osteomalacia and found a substance which he believes to be **nucleoalbumin,** the albumin of which has been partly hydrated. He gives to this substance the name of **nucleoalbumose.** The nature of this substance seems to be the same as that found in 4 other cases recorded in literature in which primary albumoses were reported to have been found. His own case agrees also with these in the general symptoms and in the fact that they were instances of multiple myeloma manifesting itself with the clinical appearance of osteomalacia and affecting the pelvis and thorax particularly.

Krehl and Matthes[3] contribute an interesting paper on **albumosuria.** Their investigations bear particularly upon the occurrence of albumoses in the urine in fever. On account of the difficulty of removing coagulable albumin without precipitating some of the protoalbumoses, they selected specimens in which coagulable albumin was absent. In the majority of cases of fever examined hydrated albumoses were detected, while in the afebrile cases they were absent. The reaction ceased with the decline of the fever. This was seen in scarlatina, diphtheria, influenza, and mumps. In pneumonia and typhoid fever reaction was found as well at the height of the disease as during defervescence. Examination determined that these albumoses were forms of advanced hydration, and therefore belong to the group of deutroalbumoses. They obtained these substances by precipitating with alcohol, and, injecting the dissolved precipitate into animals, found that fever lasting for a period of several days and amounting to from 1° to 2° C. was produced. Injecting a similar precipitate from the urine of normal persons, there was no elevation of temperature when the quantity of urine was 250 to 500 c.cm., and but a moderate elevation, lasting a short time, when the quantity was 2500 c.cm. They conclude that in the course of the fever of whatever nature the urine contains advanced forms of albumoses capable of producing fever when intro-

[1] Jour. Méd. de Paris, Mar. 15, 1896. [2] Centralbl. f. innere Med., Apr. 25, 1896.
[3] Deutsch. Arch. f. klin. Med., July 18, 1895.

duced into guinea-pigs. Besides these deuteroalbumoses they found a second substance belonging to the group of histons. Harris[1] contributes a paper on albumosuria. He considers carefully and at some length the recent literature bearing upon the nature of the proteid substances found in the urine, and particularly upon the distinctions of the albumoses from the peptones in the sense of Kühne. The author has studied the urine in a great variety of diseases by the method described, and has found albumoses or allied products in various suppurative conditions, and in pneumonia, influenza, phthisis, diphtheria, typhoid fever, syphilis, and 1 case of septicemia of unknown origin. Finally, the author states the following conclusions: that the term albumosuria should be substituted for peptonuria; that the albumoses are produced by the peptonizing action of microbes on the albumins of the body, these albumoses being produced in quantities in excess of what is necessary for the growth of the microbes. The albumoses being readily diffusible, the excess is absorbed by the blood and eliminated by the kidneys; finally, albumosuria is simply an indication of an infective condition.

Blumenthal[2] contributes studies of several case of **pentosuria** conducted under the direction of Salkowski. The first case, a man of 36, had applied for life insurance, but was refused on the discovery that the urine reduced Fehling's solution. Subsequently it was discovered that the reducing substance resembling glucose was absent, and that the urine did not undergo fermentation. During the subsequent 5 months repeated examinations were made and pentose was constantly present. The author has discovered the same reducing agent in other cases recorded as diabetes. Pentosuria is independent of the carbohydrates, of the diet, and, as far as is known at the present time, constitutes a disturbance of metabolism without serious significance.

Engel[3] has investigated the question of **bacteriuria** very elaborately. He finds that it is practically impossible to find a specimen of urine free of bacteria. In nephritis he has found a great variety of organisms, but he calls attention in particular to one which he found in 17 of 31 cases, and which he inclines to regard as the specific cause of some cases of nephritis. This is a micrococcus of characteristic growth and properties, having only moderate virulence, but capable of causing lesions of the kidneys when injected into animals. This organism was found in cases of nephritis of mild character, and the author believes it probably the cause of many cases beginning as mild forms of bacterial albuminuria. Regarding the manner in which bacteria produce their effects, the author holds that it is by poisonous products of metabolism produced *in loco*.

Vaequez and Marcano[4] have investigated the condition of the blood in so-called **idiopathic hemoglobinuria.** The cases under their observation was the paroxysmal form, occurring in a young man in whom the only possible cause was malaria, from which he had suffered some years previously. He was entirely free of this at the time he came under observation, and no

[1] Am. Jour. Med. Sci., May, 1896.
[2] Berl. klin. Woch., July 1, 1895.
[3] Deutsch. Arch. f. klin. Med., Bd. lvi. Nos. 1 and 2.
[4] Arch. de Méd. exper., Jan., 1896.

organic disease could be determined, although the urine contained a small amount of serumalbumin. An examination of the blood was made before, during, and after the paroxysm. It was found that 6 hours after the attack the red corpuscles diminished 400,000 per c.mm., 24 hours later 1,000,000 per c.mm. The diminution of hemoglobin was not proportionate with the diminution in the red corpuscles, but was considerably greater than would have been expected, and the regeneration of the hemoglobin was not as rapid as that of the red corpuscles. They found the alterations in the erythrocytes which Hayem has described—namely, the appearance of certain corpuscles as if they were losing their color gradually. These authors state that hemoglobinuria is rather poor, but generally accompanied by general destruction of red corpuscles during the attack. The loss of hemoglobin greatly surpasses that of the red corpuscles, as in 1 case the hemoglobin decreased $\frac{1}{3}$, while the loss of red corpuscles decreased by $\frac{1}{9}$ of the normal number. They hold that paroxysmal hemoglobinuria is a symptom and not a specific affection, and that it is necessary in every case to study the blood in order that different varieties of the disease may be distinguished.

NEPHRITIS.

Etiology.—Dessy[1] reports a case of nephritis due to the **staphylococcus pyogenes albus.** The patient died of an intercurrent attack of measles. The examination of the blood as well as the urine removed with aseptic precautions showed staphylococci repeatedly during life, and after death as well. Postmortem the kidneys showed evidences of old sclerotic changes of the glomeruli with amyloid disease of the blood-vessels. In addition to this there was acute leukocytic infiltration. The portal of entrance of the microorganism was not discovered. [It is quite likely that very many different forms of microorganisms are capable of causing nephritis. In septic diseases staphylococci and streptococci have been frequently discovered.]

Bruhns[2] records 7 cases in which marked acute **nephritis followed eczema.** The suspicion that drugs used for the eczema caused the nephritis was considered, and it is asserted that in several instances this could be entirely excluded, while in others it was quite probable that the drugs were not concerned in the development of the disease. The urine contained blood, albumin, and epithelial, hyalin, and granular casts.

Von Wunscheim[3] has investigated the **etiology of suppurative nephritis,** examining 24 cases, of which 16 were instances of ascending infection, the other 8 cases of hematogenous infection. In the latter cases staphylococci were found 3 times, the diplococcus pneumonia in 1, and the bacillus of typhoid fever in 2. Of the 16 cases of ascending nephritis, 4 were complicated with pyemia, and in these staphylococci were discovered in 3 and streptococci in 1. In the 12 cases of uncomplicated ascending nephritis the bacillus coli communis alone was found. [The frequent discovery by the author and by others before

[1] Lo Sperimentale, Aug., 1895.

[2] Berl. klin. Woch., July 15, 1896.

[3] Zeit. f. Heilk., Bd. xv.

him of the bacillus coli in ascending infections of the urinary tract establish this as the most frequent microorganismal cause of such infections.]

Holz[1] reports 6 cases of acute **hemorrhagic nephritis** occurring in young persons after falls, but without injury to the spine; 2 of these cases were fatal, and died during the continuance of the symptoms; 4 recovered. In the latter the disease of the kidney did not apparently affect the general health, and in a few days the symptoms disappeared entirely. The author excludes injury of the central nervous system, from the fact that there was no injury of the skull or spine. In the 2 fatal cases small hemorrhagic areas were found in the substance of the kidney, but microscopically, in addition to the minute points of hemorrhage scattered throughout the organ, there were distinct parenchymatous changes. Holz looks upon this condition as one of a similar nature with that known as commotio cerebri.

Symptoms.—Bonnier[2] calls attention to the fact that it has long been recognized that **cramps** may be associated with Bright's disease, and suggests that some of the instances of professional cramps may be dependent upon nephritis. He details a case occurring in a telegrapher who developed an occupation-cramp following an attack of small-pox, and had also symptoms of nephritis. All treatment was unavailing until the patient was placed on a milk diet after the Bright's disease was recognized.

Pye Smith[3] calls attention to the forms of **skin-affections** which occur in Bright's disease. Among these are bright red papules similar to those caused by sweating, large discrete papules seated on a dry and sometimes scaly skin, moist dermatitis affecting the legs and arms, but not the flexures of the joints and not attended with irritation, and lastly extensive dermatitis resembling exfoliative dermatitis. All of these forms are superficial and very late in the disease. They bear no direct relation to the progress or the course or severity of the affection.

Pick[4] reports a case of **sudden amaurosis** subsiding after 24 hours, and being followed by left-sided hemianopsia, in a patient suffering with chronic nephritis. At the autopsy a spot of softening was found in the right occipital lobe. No cause for this softening was found, and the author inclines to regard it as the result of toxic influence upon the vasomotor system of the brain or upon the blood itself, causing coagulation in the vessels and consequent necrosis. The amaurosis and hemianopsia found in uremia he looks upon as results of toxic action on the central optic apparatus.

Uremia.—Ajello and Paravecandalo[5] conclude from their experiments on animals that uremia is due to the absence of the normal internal renal secretion. Animals in which one kidney was removed suffered with albuminuria and cachexia after a certain time, while animals treated in a similar manner, but receiving injections of renal extracts after the operation, did not suffer albuminuria or cachexia.

[1] Münch. med. Woch., No. 34, 1895.
[2] Compt. rend. de la Soc. de Biol., Feb. 21, 1896.
[3] Brit. Med. Jour., Nov., 1890.
[4] Deutsch. Arch. f. klin. Med., Bd. lvi. H. 1 and 2.
[5] Lo Sperimentale, an. xlix. fasc. 4.

Stengel[1] considers the occurrence of **fever** in Bright's disease, and particularly in the uremic state. Fever may be associated with the onset of acute nephritis, and at this stage is ascribable either to the degenerative and inflammatory lesions of the kidney, to retention of toxic substances, or to the original infective or toxic cause of the disease. In a second group of cases elevation of the temperature is due to inflammatory complications, such as pleuritis or pericarditis. The degree of fever in such cases is inconsiderable, especially when compared with that occasioned by the same complications occurring in rheumatism. Finally, there are cases of **febrile uremia.** These may be sudden and intense and associated or unassociated with convulsions. It is specially to be noted that the temperature frequently rises before convulsions begin. A second form of febrile uremia resembles slow infectious processes in its manifestations, and particularly the typhoid state. To this the name "slow uremic fever" might be applied. A number of cases are introduced in illustration of the various types.

Rendu[2] has reported a case of **uremic aphasia** in a man of 56 who had been suddenly seized with an apoplectic attack. The morning following he had regained consciousness, and presented only aphasia, monoplegia of the right arm, and a systolic murmur at the base of the heart. Subsequently, clear evidences of uremia were obtained and the patient was bled. The monoplegia and aphasia entirely disappeared. The author concluded that the symptoms were due to uremic intoxication, and in the discussion Hanot expressed the same view regarding the similar attacks occurring in pneumonia and other infectious diseases, while Dufloeq mentioned a case of aphasia occurring in cholera in which the autopsy showed no lesion.

Diagnosis.—Reinecke[3] undertook a series of experiments to determine if it were possible to decide as to the presence of nephritis when leukocytes were in the urine in considerable quantities. In a case of acute cystitis they found that the amount of albumin bore a close relation to the number of leukocytes, varying as they varied and disappearing as they disappeared. Accepting the proportion of 1% of albumin by volume (Erbach) as equal to 100,000 leukocytes in a cubic cm., the amount of albumin was considerably in excess; nevertheless, as there were no evidences of nephritis, they concluded that it was due to the leukocytes. In a case of pyelitis the curves were closely parallel and nephritis was excluded. In 1 curious case it was estimated that 57 billion leukocytes were excreted in 24 hours—a number that very considerably exceeds that of the white cells normally present in the blood. He concludes that estimations of the pus-cells frequently fail to give the exact measure of the amount of pus excreted, but that nevertheless the regular daily count gives a good idea of the course of the case and indicates the effect of therapeutic measures, and that, in connection with the differences of the quantity of albumin, it frequently serves to decide the question as to whether nephritis is present or not.

[1] Am. Jour. Med. Sci., Nov., 1895.

[2] Gaz. méd. de Paris, Apr. 4, 1896.

[3] Berl. klin. Woch., Sept. 9, 1895.

Eisenschnitz[1] records the case of a girl of 16 who was treated for nephritis with universal edema and ascites. The abdomen was tapped twice, and the fluid contained 0.15% of albumin, .2% of sugar, and traces of fat. No fat-droplets were visible microscopically. Death occurred from uremia, and post-mortem a thrombus was found in the innominate vein at the point of entrance of the thoracic duct. The thrombus was movable, and the author believes the lack of chylous ascites was due to the valve-like closure of the orifice by the thrombus.

Treatment.—Friedrich[2] employed **urea as a diuretic** in 2 cases—1 of interstitial nephritis and 1 of hepatic cirrhosis—in both cases with markedly beneficial effect.

Klug[3] reports excellent results from **phlebotomy** in a case of acute hemorrhagic nephritis. There was no evidence of anemia, but considerable hematuria and edema, both of which were greatly benefited.

Huchard[4] reports a case of albuminuria and uremia occurring after the application of a **blister.** De Cresantiques[5] has observed 2 cases in which death occurred after the application of a blister. He warns against the use of cantharidal vesication in febrile diseases, because of the irritation of the kidneys already present due to the elimination of toxins.

Tyson[6] reports 2 cases of nephritis in which **salol** was given for diarrhea, and in which there was great reduction in the quantity of urine. In 1 case complete suppression of urine with a fatal issue occurred. The doses given were 5 gr., in 1 case 2 doses having been taken, and in the other but 1. [It is not improbable that the sudden control of the diarrhea by the bismuth and salol administered may have had an effect quite aside from the supposed direct effect of the salol.]

Pyelitis.—Ingria[7] reports a case of **calculous pyelitis** with atrophy of the opposite kidney in consequence of previous calculous pyelitis. The remarkable feature in the case was the fact that total anuria lasted for 8 days. No tumor developed in the region of the kidney, but on the 6th or 7th day edema of the eyelids and somnolence developed, and the breath of the patient had a urinous odor. A small concretion was discharged and the secretion of urine at once reestablished. The patient lived 4 years after this attack.

Eichhorst[8] reports the case of his son who acquired severe cholera morbus at a summer resort. On the 4th day there was burning pain at the end of urination, which soon became more severe with strangury. On the following day the urine contained a number of small lenticular reddish-yellow calculi, from the size of a poppyseed to that of half a pea, also some blood-clots and large numbers of uric-acid crystals.

Tuberculosis.—Mendelssohn[9] reported a case of calculous pyelitis

[1] Wien. klin. Rundsch., 1895, Nos. 50 and 51.
[2] Berl. klin. Woch., Apr. 27, 1896.
[3] Semaine méd., xv., 1895, p. 174.
[4] Rev. de Thérap., No. 7, 1896.
[5] Bull. gén. de Thérap., 1896, 6e liv. p. 187.
[6] Univ. Med. Mag., Apr., 1896.
[7] Gaz. med. di Torino, 1895, vol. xxvii.
[8] Deutsch. med. Woch., 1896, No. 49.
[9] Centralbl. f. innere Med., Apr. 25, 1896.

which was regarded as tuberculous and the kidney removed. In the discussion Leyden called attention to the fact that the discovery of bacilli having the features of tubercle bacilli must not be at once regarded as distinctive, as smegma bacilli are found in almost every specimen of urine, more often in women than in men. The behavior of these toward stains is much the same as is that of tubercle bacilli. He calls attention to the granular particles that occur in the urine in tuberculosis and to the coincident affection of the epididymis and prostate often observed. Gerhardt, Senator, and Fränkel agree with Leyden's view, but the latter points out that if the original Ehrlich method of staining is employed, the tubercle bacilli alone remain colored, and that the smegma bacilli do not occur in peculiar curved chains or groups like tubercle bacilli. Casper held that the use of alcohol containing HCl would discolor the smegma bacilli and not the tubercle bacilli. Hamill[1] records the case of a child that at the age of 7 months became feverish and restless, and had diarrhea with offensive stools. There was high temperature, and subsequently nervous symptoms developed. At death the right kidney was found to be several times the size of the normal kidney, being about 5 in. in length and $2\frac{3}{4}$ in breadth. The surface was irregularly nodulated, and it was found to consist apparently of a mass of various sized **tubercular nodules.** He makes a careful study of primary renal tuberculosis, and finds that the general causes are those of tuberculosis elsewhere, but that it is particularly apt to occur in males in early adult life. Usually the condition is unilateral, but if bilateral it is more pronounced on one side. It is probable that infection is usually from the blood, and he considers the possibility of the entrance of tubercle bacilli into the circulation without development of local lesions at the portal of entrance, urging in support of this view the frequency of tuberculous disease of the mesenteric glands without the occurrence of intestinal lesions. Perineal and pelvic abscesses frequently occur as complications, and the disease sooner or later involves the ureter, and even produces some changes in the wall of the bladder. The symptoms are pain, hematuria, and, in the late stage, constitutional disturbances. Of the 55 cases he finds in literature, tumor was observed in 23. The most important symptom is the discovery of the bacilli in the urine. In the 17 cases that he has collected upon which operations were performed, nephrotomy was done 4 times, with 2 recoveries, 1 improvement, and 1 death; nephrectomy was done 9 times, with 5 recoveries, 1 improvement, and 3 deaths from the operation. Nephrotomy followed by nephrectomy was resorted to in 4 cases; 2 recovered, 1 died, and 1 improved. As these operations were all undertaken upon advanced cases, Hamill argues that the results will probably be much better if the resection of the kidney is performed when the disease is absolutely localized and before softening has begun; that is, in the earlier stages.

Tumors.—Short[2] records a case that was characterized by severe pain across the loins and pyuria. The pain was intense, always becoming worse at night. Cachexia supervened, and the pain seemed to settle in the right

[1] Internat. Med. Mag., Jan., 1896. [2] Birmingh. Med. Rev., Mar., 1896.

sacral iliac joint, but later returned to the lumbar region. At the autopsy a large semisolid growth was found which occupied the left side of the abdominal cavity and appeared to surround a part of the left kidney. From gross appearance it was supposed to be carcinoma. McWeeney[1] reports 2 cases of tumors of the kidneys derived from the growth of **suprarenal "rests."** Both of his cases were women, their ages being 53 and 38 respectively, and both cases involved the left kidney. One recovered after the operation, being alive 3½ years after the removal.

ANIMAL PARASITES.

Protozoa.—Dock[2] reports a case of **trichomonas** in the urine. The patient, a student of 27, had had malarial fever, and consequently suffered with frequent urination, which was usually painful and bloody. There was no history of venereal disease. The urine when passed was pale yellow, clear, and contained a number of small whitish flakes about the size of pinheads, and some clear mucus. In these flakes were found peculiar flagellated parasites resembling very closely the Trichomonas vaginale of Donné. They varied from 15 to 25 mm. in length and from 7 to 15 mm. in width. Most commonly they were pyriform in shape, with one end rounded. The nucleus was always in the clear part, usually lying somewhat obliquely. Dock agrees with Künstler that the normal number of flagellæ is 4, but it is very difficult to see them all, the maximum number usually observed being 3. When only 3 are seen 1 flagella is thicker than the others, but this is not the case when all 4 are apparent. The posterior end of the body is sometimes prolonged into a long taillike process, and this tail appears to be due to the formation of a soft, thin, adhesive pseudopod, by which the parasite attaches itself to the cover-glass or other object. Occasionally 2 parasites are attached by the tails, which has given rise to the supposition of transverse division. Curiously enough, if 1 parasite in a preparation be found with a tail, nearly all the others possess it, and, when this organ is lacking in 1, it is lacking in all. A shallow depression or cleft near the insertion of the flagella probably serves as a mouth. Physiologically, these organisms may throw out pseudopods that are capable of a kind of oscillatory or jerking motion. They are very susceptible to cold; quinin kills them in about an hour, causing them to fill up with large clear vesicles, and salicylic and boric acids have the same effect. It was impossible to cultivate these organisms in the bladders of any of the lower animals. Reproduction is usually by longitudinal division, but there is probably some other mode which resembles sporulation. In conclusion, the author states that he cannot consider the trichomonas a harmless parasite, and that it is probably not as rare as the few reported cases seem to indicate. (See also *Dysentery* and *Diseases of the Lungs*.)

Vermes.—Moosbrugger[3] details the history of 3 cases of **trichocephaliasis** occurring in children, in whom severe symptoms were noted. Occa-

[1] Brit. Med. Jour., Feb. 8, 1896.
[2] Am. Jour. Med. Sci., Jan., 1896.
[3] Münch. med. Woch., 1895, p. 1097.

sional bloody diarrhea and prostration were the symptoms observed. One of the children, aged 3 years, died of intercurrent croup, and at autopsy many worms, partly in clusters and partly free, were discovered. Ulcers and cicatrices were observed in the colon. No cases of such severity have been previously recorded.

Askanazy[1] has investigated the Trichocephalus dispar, and concludes from the fact that ferruginous pigment is always found in the epithelium of the intestinal tract that the worm lives upon blood it abstracts from the vessels of the mucous membrane of the intestine.

Ogilvie[2] refers to a previous paper published in 1894, and again insists upon the points contained therein—viz. that a preparatory treatment of considerable duration is necessary before the administration of remedies for **tapeworm,** and that the doses of the latter (filix-mas) should be considerable. He reports 1 case in a girl of 7 in which small doses had been used and had caused toxic effects, and in which he subsequently gave large doses (1 dram at 8 A. M., and 45 minims after an hour). There were no toxic effects, and the worm was removed entire. He holds that the smaller doses are retained in the bowel and to some extent absorbed, while the larger doses are discharged, sometimes within 2 hours, and frequently before the final dose of castor oil has been administered. Regarding the preparatory treatment, he advises saline aperients to be taken for a week, so as to rid the bowel of excessive mucus and expose the parasite to the full action of the poison. The vermifuge is given in 2 doses, as indicated, before and after the administration of the latter. Castor oil with jalap is used as a rapid purge.

Sommer[3] has collected all the recorded cases of **echinococcus disease** in the United States. He finds 67 cases in man, of which 17 were foreigners and 4 negroes: 24 of these cases occurred in New York State.

Garceau[4] records the case of a German who ate a small quantity of raw smoked ham. For 2 weeks he felt rather miserable, and then began to have some fever. The muscles began to feel sore, and there were a few red spots on the abdomen, which disappeared on pressure. Subsequently the pains in the muscles became more severe, and the case developed as one of typical **trichinosis.** No difficulty was experienced in finding the parasites in the muscles.

Thornhill[5] reports upon the extreme frequency of the **anchylostoma** as a parasite of man in India, Assam, and Ceylon, quoting extracts from reports of Dobson and McConnell of Assam and Calcutta. The figures show that the parasite is enormously distributed, and has been found in the stools of hundreds of healthy-looking persons. From this Dobson inferred that the parasite is quite harmless, but, as Thornhill points out, the duration of the parasitism and the number present have much to do with the occurrence of the symptoms, as has also the health of the person. Thornhill holds that it is one of the most dangerous of human parasites.

[1] Deutsch. Arch. f. klin. Med., Bd. 57, Heft 1, 2. [2] Lancet, June 20, 1896.
[3] N. Y. Med. Jour., Nov. 2, 1895. [4] Boston M. and S. Jour., Nov. 21, 1895.
[5] Indian Med.-Chir. Rev., Oct., 1895.

Turner[1] has experimented with all the methods recommended for treating anchylostomiasis, and has determined that the only valuable drug is **thymol,** administered in large doses according to the recommendation of Sonsino. After strict milk diet for a day or two an aperient is administered, and the following morning ½ g. to 1 g. doses at hourly intervals, followed by a saline. This treatment must be repeated two or three times at intervals of a week or more until the eggs have disappeared from the feces. Alcohol in any form must be prohibited during the treatment. In some of the cases several hundred worms were expelled.

Austin Flint[2] reports a case of **chyluria** due to the **Filaria sanguinis hominis,** cured by the use of **methylene blue.** The patient was a West Indian aged 22. The urine was opaque and milky, and showed no tendency to precipitation. Its specific gravity was 1014; it was acid and contained 0.2% of albumin, but no sugar. There were abundant fat-globules and chyle-corpuscles, but no casts. The filariæ were very numerous in the blood taken at night. Two gr. of methylene blue were given every 4 hours for a day, when the urine became clear, but intensely blue, and the blood was almost free of parasites. This continued until the eighth day, when the chyluria reappeared, and on the ninth day the blood contained numerous parasites. The treatment was resumed the tenth day and continued 5 days. The urine became normal and the parasites disappeared, and the patient has remained well for a year.

Henry[3] reports a case of indigenous parasitic **chyluria with Filaria nocturna** in the blood. The patient developed chyluria on the third day after childbirth, the urine containing blood and mucous coagula. She had in childhood suffered from two chronic abscesses, and about a year before this observation from an attack described as malaria fever. Filaria embryos were found in the blood examined at 10 P. M. They were never found in the mother's milk or in the blood of the infant, and very rarely in the daytime. Leeches were applied in order to test the question as to whether they can act as intermediate hosts, but as the filariæ died as quickly in the body of the leech as upon the glass slide, Henry concludes that these animals do not act in this manner. Quinin and ergotin were without apparent effect. Thymol caused the chyle to disappear from the urine for 7 days, although the filariæ during this period were found abundantly in the blood. Methylene blue was finally employed, 2 gr. being given every 3 hours. It was continued until the urine and feces were stained a deep blue. The serum of the blood was also blue, and the filariæ showed an exceedingly faint bluish tinge, but their vitality was unimpaired. Upon the theory that another infection might destroy the parasite, the patient was vaccinated shortly after admittance to the hospital, but without result as far as the filariæ were concerned. Henry believes that in this case infection occurred in Florida, where the patient had spent the previous year, and expresses opinion that all treatment is futile.

[1] Intercolonial Med. Jour. of Australia, Feb. 20, 1896.

[2] N. Y. Med. Jour., June 15, 1895.

[3] Med. News, May 2, 1896.

RÖNTGEN SKIAGRAPHY.

[The interesting discovery of Prof. Röntgen promises to be of great usefulness in practical medicine. It is, of course, most immediately applicable in surgical diagnosis, and particularly in the recognition of fractures, dislocations, and other affections involving the bones. A number of investigators have, however, devoted themselves to the study of the uses of Röntgen skiagraphy in the diagnosis of organic diseases or affections usually falling to the care of medical men. As yet no positive progress can be reported, though a number of interesting communications have appeared. A few of these are referred to below. It seems desirable to refer to the work of Williams of Boston, who has contributed several important papers[1] touching upon the applicability of the Röntgen rays in the diagnosis of pulmonary affections. We have ourselves conducted certain investigations in the same direction, and have obtained most encouraging results in cases of intrathoracic aneurysms. These studies, however, have not yet been published, From present knowledge it may be confidently asserted that pulmonary lesions will soon fall into the domain of the conditions recognizable by the Röntgen method.]

Leo[2] discusses the value of the Röntgen rays in internal medicine, and in particular has investigated the permeability of solid calculi for these rays. He found that uric-acid, cystin, and cholesterin stones, two of each kind, were almost equally impermeable. He estimated the specific gravity of each calculus, finding the uric-acid stones 1.350 and 1.564, the cystin stones 1.420 and 1.310, the cholesterin stones 1.047 and 0.825. It is evident, therefore, that the mere specific gravity does not determine the permeability, and he suggests that certain tumors may be discovered by this method, in view of the fact that a substance of the light color and translucency of cystin obstructs the rays.

Huber[3] remarks that in various swellings of the joints it may be impossible to determine by palpation whether the changes lie in the joint-ends, in the cartilages, or in the soft parts. The Röntgen rays serve a useful purpose, and the author details several cases of chronic rheumatism and of gout in which the osseous or gouty nodules were satisfactorily outlined. The uric-acid deposits of gout allow the rays to pass through fairly well.

Hoppe-Seyler[4] refers to the use of the Röntgen rays in the diagnosis of arteriosclerosis. In a case of fibrosarcoma of the leg the radiograph showed irregularities in outline and variations in thickness of the anterior and posterior tibial arteries, indicating variations in the development of the atheromatous process. In another case the arteries of the hand were plainly visible, appearing as narrow bands alongside of and between the metacarpal bones. The pulsation of the vessels of course interferes somewhat with the accuracy of the result.

[1] Trans. of Assoc. Am. Physicians, 1896; Boston M. and S. Jour., Sept., 1896.
[2] Berl. klin. Woch., Feb. 24, 1896. [3] Deutsch. med. Woch., Mar. 19, 1896.
[4] Münch. med. Woch., Apr. 7, 1896.

GENERAL SURGERY.

By W. W. KEEN, M. D., and JOHN CHALMERS DaCOSTA, M. D.,

of Philadelphia.

ASEPTIC AND ANTISEPTIC SURGERY, INCLUDING LIGATURES, SUTURES, DRESSINGS, BANDAGES, ETC.

"A New Method of Treating Wounds Antiseptically" is the title of an article by Schleich.[1] He discovered that when a solution of gelatin in water is evaporated over the vapor of formalin a product results which is hard, which is transparent, which is without chemical activity, and which is resistant to heat, moisture, and other ordinary influences. He found by experiment that when this formalin-gelatin was introduced into the peritoneal cavity of animals it was partly digested and partly encapsulated by connective tissue. When he introduced pathogenic bacteria into wounds, and at the same time introduced the powdered gelatin, no wound infection occurred. The applications were made to human beings. Suppuration was avoided, except when necrotic tissue was present and when specific infections existed. When applied to necrotic tissue the profuse secretion prevented the healthy cells from coming in contact with the gelatin, and hence forbade the elimination of formalin. In such infected areas the addition of a solution of pepsin and hydrochloric acid permits the formalin to be set free. Formalin-gelatin is prepared by adding 500 grams of pure gelatin in solution with 25 drops of pure formalin solution, and evaporating to dryness over formalin vapor. The product of the evaporation is powdered and is preserved in the presence of a drop of formalin solution. Formalin-gelatin can be mixed with lime salts and be used to replace bone defects. [During the past summer we have been testing this agent, which is furnished commercially under the name of glutol. It is a very valuable material in the treatment of wounds, of infected wounds, sinuses, ulcers, abscesses, boils, furuncles, and like conditions. During the fall of 1895 some experiments in closing bone defects were conducted in the surgical out-patient department of the Jefferson Hospital by DaCosta before the publication of Schleich's article: some of them had been set forth to classes, but enough observations had not been made to warrant publication before the appearance of the distinguished German's paper. One of the agents used was gelatin containing a small amount of formalin. Keen presented in the public clinic a case of necrosis of the tibia, and an attempt was

[1] Therap. Monatsh., 1896, No. 2.

made to close the cavity by the use of this gelatin. Schleich has made a complete investigation; has exhibited the proper method of preparation and use; has demonstrated its value in clean wounds and infected areas; has successfully filled cavities in bone; and has given a new and valuable agent to the surgeon.]

Haenel[1] discusses the problem, **"Is the disinfection of wounds possible?"** He believes that it has been clearly demonstrated that it is impossible to disinfect tissues with chemicals, and that the best means of surgical treatment is to provide free drainage for wound discharge and to absorb all secretions in dressings. The best means to provide for wound discharge is to keep the wound partly open. He was led to these conclusions by a study of his results after experimenting on 44 guinea-pigs. [This is in strict accordance with the well-known views of Schimmelbusch. There can be no question that infected wounds should invariably be drained. Although organisms in a wound cannot be killed by the use of chemical germicides, it is possible that the chemical which remains in the wound may prove antagonistic to toxines which arise from bacterial growth; hence we advocate the irrigation of infected wounds with corrosive sublimate. The common habit of irrigating aseptic wounds with corrosive sublimate is to be strongly condemned: it irritates the tissues, adds to discharge, and renders drainage imperatively necessary. Tillmanns has shown that antiseptics render cell division late in beginning and sluggish in progress—that repair is far quicker when antiseptics have not been used; in the wounds which follow an aseptic operation a firm cicatrix is formed in 8 days; in wounds in which bichloride of mercury has been used the granulation tissue has scarcely begun to be fibrous in 8 days. It is never any use to irrigate fatty tissue (as the breast) with antiseptics. The oil renders it impossible for the chemical to reach microorganisms, and the irritant agent is apt to induce subsequent fat-necrosis.]

Kane[2] calls attention to the value of fireproof **asbestos as a surgical dressing.** He maintains that on account of its indestructibility when subjected to high temperatures it is the only material which as a dressing can be rendered absolutely aseptic, while the variety of forms in which it is manufactured gives us materials which possess all the attributes of cotton fabrics as used in surgery, being even more satisfactory. Asbestos dressings can be kept as carelessly as if they were germ-proof. They may be carried around in any form of parcel or handbag, and may be even spattered with blood or filth, and yet can be rendered absolutely pure in less than two minutes by throwing them upon the coals or into the blaze of an ordinary kitchen fire. Kane now carries with him a compact parcel containing a supply of dressings of every sort. [It seems to us that Dr. Kane has contributed a fact of some value. To be able to obtain at any time and in almost any place a safe aseptic dressing is certainly most important, and he proves that asbestos is such a material. We lack personal experience, but think this method promising. If a demand is established for asbestos, beyond question finer prepa-

[1] Deutsch. med. Woch., 1895, No. 8.

[2] Jour. Am. Med. Assoc., Dec. 7, 1895.

rations of it will be manufactured. The use of such dressings would save much money to large hospitals.]

"**The Treatment of Aseptic Wounds without Bandages or Dressings**" is the title of an article by Mackenzie.[1] He says that bandages are uncomfortable, are costly, and are liable to become displaced—that the essentials in the healing of a wound are—1. To maintain the parts at rest and the raw surfaces in close and constant apposition; 2. To prevent contamination of the wound from external sources; 3. To get rid of the wound discharges. He retains the raw surfaces in contact and the parts at rest by the systematic employment of buried catgut sutures. The raw surfaces are laid together in the position they are intended to assume. The points of contact are noted, and sutures of catgut are inserted through the raw surfaces, never penetrating the skin. These sutures are inserted a sufficient depth, and the opposing surfaces are then drawn firmly together. This is done systematically from the bottom of the wound to the skin-edges, the separate sutures being in rows, and the number of sutures in each row varying according to the ease or difficulty with which the raw surfaces can be maintained together. Even fine catgut applied by this method will maintain the parts in contact long enough to ensure adhesion of the surfaces before absorption of the catgut has taken place. The skin-edges are brought together and maintained in apposition by a continued catgut suture, including but a small extent of the cut cutaneous edges. A solution of celloidin is applied over the line of skin incision and for a half inch either side of it. This solution dries quickly, and leaves a thin transparent and adherent film which is sufficiently elastic to adapt itself to the wrinkles produced by movements of the parts. The solution of celloidin is made by dissolving 1 part of celloidin in 4 parts each of absolute alcohol and sulphuric ether. As the celloidin will not set in the presence of water, the wound after it is sutured should be covered for a few minutes with a piece of lint wet in carbolic solution, which lint is left in position until the patient is placed in his bed. By this time oozing from the skin stitch holes has ceased. The wound and surrounding skin are then carefully dried with a piece of lint soaked in rectified spirit, and then with a piece of lint soaked in absolute alcohol, and while the part is still moist with the absolute alcohol the celloidin is painted upon it. No bandages or dressings of any sort are required. The discharged blood from the aseptic wound is absorbed; the wound also absorbs its own discharges, and no contamination can take place from the outside. The post-operation oozing which is so common after ordinary methods of wound closure is to a large extent prevented by the firm contact of the raw surfaces brought about by the buried sutures; but when this oozing does occur there is no more need of drainage than in an ecchymosis or a hematoma produced by a blow with the skin intact. In some few cases it may be desirable to provide means of drainage. In order to secure this before the wound is closed, a small hole is made through the skin and subjacent tissues at its most dependent part, and as far

[1] Brit. Med. Jour., Feb. 1, 1896.

away as possible from the skin-edges of the wound. A piece of drainage-tube is passed into the wound, which tube is to fit very tightly the hole in the skin. The portion of the tube which is to be *in* the wound should have been perforated; the portion which is to hang out should be unperforated. The piece of unperforated tubing outside of the wound is introduced into a bag made of gutta-percha tissue containing sponge soaked in a strong antiseptic. The mouth of the bag is closed on the tube and glued to the tube by softening the gutta-percha with chloroform. In some cases it is advisable to paint the celloidin about the drainage opening and the tube at this point, but usually it is tight enough without doing so. If the wounds are not aseptic, and there is no possibility of healing by first intention, the above method is of no use and cannot be employed. The advantages of this method are very striking when the wound is near one of the natural orifices of the body, where dressings and bandages are very uncomfortable and fail to protect the wound. In wounds about the face this method is particularly successful.

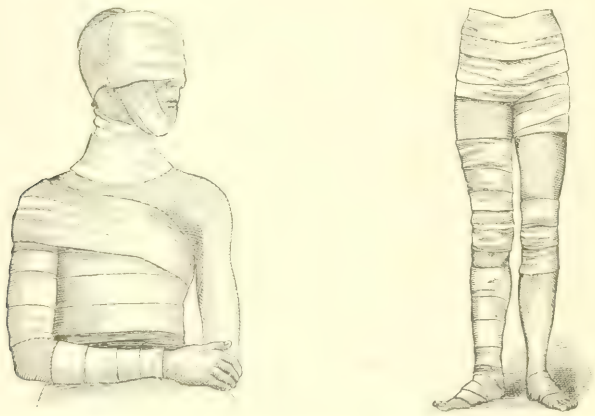
[The value of buried sutures in many cases is beyond question. They should never be used in infected wounds, and should only be employed by surgeons who are sure of their capacity to obtain asepsis. Novices and bunglers will never succeed in safely employing them. The value of buried sutures has been long and ably advocated by Dr. Marcy of Boston. He no longer uses catgut, because it is difficult to disinfect with certainty, because it does not last long enough, and because it is structurally weak and stretches when it is moistened, and hence often fails to maintain the wound surfaces in apposition. He now uses tendon sutures, especially kangaroo tendon. This structure can be asepticized with certainty, and is extremely strong. Kangaroo tendon lasts in the tissue for 60 days or more, and is replaced by fibrous tissue, which acts as a sort of permanent buttress against separation of the wound.

Buried tendon sutures are of especial value in the radical cure of hernia. Celloidin is a concentrated collodion, but ordinary collodion answers all purposes. We see no especial use in the rubber bag to catch the wound fluids, and would fear its displacement.]

Gigli[1] gives us a method for the easy **removal of plaster-of-Paris bandages.** After applying cotton about the limb a layer of moist parchment paper is put above this cotton. A large sized cord greased with vaseline is placed upon this cotton in the direction that one would need to saw to open the plaster. Over this the plaster is put on. When in the course of time we are ready to remove the plaster the cord, whose ends project beyond the bandage and have been tied together, is loosened, and one end tied to a thin steel wire which has been nicked at intervals by means of a file. The wire is then drawn through in the cavity formerly occupied by the cord. Each end of this wire is attached to a handle, and the plaster can be readily sawed through, after which it is removed. [Several trials assure us that this method is practically useful and saves much time and trouble.]

[1] La Semaine méd., No. 3, 1895.

Fox[1] contributes an article on "A System of **Circular Bandaging.**" He states that 16 years ago an elastic tubular bandage was first used by him and recommended in the treatment of eczema and ulcers of the leg. He says that pure rubber applied to the edematous surface often produces brilliant results, but it is liable to cause in the delicate skin, and especially in hot weather, considerable irritation. Recently various forms of elastic webbing have been recommended for bandage purposes, and where simple pressure is required this webbing, being light and porous, has decided advantages. Of the use of elastic webbing in roller form nothing need be said, but he desires to call attention to the use of this webbing in the form of circular or garter bandages. These can easily be made by cutting the webbing in pieces of varying length and sewing the ends together, thus making elastic and tense garters of varying size. With a supply of these at hand almost any part of the body can be rapidly and strongly bandaged, and any degree of pressure can be applied which is apt to be required. Save where the bands overlap at the margin there is but one thickness of bandage, and no ordinary muscular effort upon the part of the patient lessens or displaces it. The accompanying illustrations exhibit the circular bandage as applied to various parts of the body (Figs. 5, 6). It is a great convenience for the retention



FIGS. 5, 6.—Circular bandaging (Fox, in N. Y. Med. Jour., Nov. 9, 1895).

of dressings in skin diseases, and the steady pressure which it exerts in many instances reinforces the value of the ointment applied to the skin. It is very efficient in varicose veins of the leg, and is a valuable substitute for knee-caps, anklets, and other joint bandages. It is well to have a supply of bands of various sizes at hand. With a tape measure the circumference can be ascertained and bands selected an inch or more smaller than the part, according to the degree of pressure required.

A new method of **bandaging the thumb** is discussed by Selva.[2] He says he has devised a method of bandaging the thumb: the length of bandage is 4 to 6 meters, and the width from $2\frac{1}{2}$ to 3 cm., according to the size of the

[1] N. Y. Med. Jour., Nov. 9, 1895.

[2] Med. News, Sept. 28, 1895.

hand. The hand is held in a position of semipronation, the thumb pointing upward and being abducted at an angle of 50°, so that the end of the distal phalanx is in line with the heads of the second and fifth metacarpal bones.

"The first stage of the application of this bandage consists in covering the terminal phalanx: the initial end is applied to the outer lateral surface of the second phalanx of the thumb near its base, and the roller is carried along the surface over the palmar side of the pulp of the distal phalanx to the inner lateral surface of the second phalanx; this turn is held in place by means of the index finger and thumb of the left hand of the operator; then the roller is returned in a *recurrent* form to the place of origin; this last turn should overlap the preceding one, and should be placed in as dorsal a position as possible; then the roller is directed downward and inward over the dorsum of the terminal phalanx, and is turned around the very tip of the pulp, forming a loop that will cross at a point corresponding to the center of the nail. Having thus covered the terminal phalanx, the roller is carried over the dorsum of the hand as low down as the head of the fifth metacarpal bone, the thumb all the time being held *abducted;* it is then turned over the palm of the metacarpus to the dorsal surface of the terminal phalanx, at the point of the first crossing, thus forming a figure-of-8 turn. This turn can be repeated over itself if the first one is not firm enough for starting. Then a series of successive figure-of-8 turns are made, each overlapping its predecessor and being about half a centimeter apart, forming an *ascending spica;* these turns are carried as high as the carpometacarpal articulation, and the bandage is ended by pinning it at the palmar surface of the ball of the thumb or by splitting and tying it around the metacarpus.

"This bandage is essentially a figure-of-8 form, the *smaller* or *lower* loops of which go around the first and second phalanges and part of the ball, and the *larger* or *upper* loops pass and overlap each other around the metacarpus and upper portion of the ball of the thumb. The bandage can be applied as high as necessary, and in order to completely cover the very highest portion of the ball the lower loops should be applied nearer together, or they can be repeated over themselves at the palmar surface of the base of the second phalanx, whereas the upper loops can be applied successively in an ascending form over the surface of the ball. Of course if there is no indication the *recurrent* portion of the bandage may be omitted, in which case the roller is started by one or two circular turns around the *end of the distal phalanx*, and then the rest of the bandage is applied as before. If after starting the roller should be directed first over the *palmar* surface of the metacarpus in making the upper loop, the crossings of the figure-of-8 turns will be situated on the palmar side of the thumb.

"It will be noticed that these figure-of-8 turns not only overlap themselves, but they also exert an *ascending compression*, which adds strength to the bandage and produces efficient immobilization of the thumb. As these turns are being applied, the thumb, which originally was in a position of

abduction, is gradually approached to the metacarpus, and it becomes more and more *adducted*.

"This bandage, unlike the others that have been previously described, does not begin or end at the wrist: it is a bandage that is applied to the phalanges of the thumb and to the metacarpus, and consequently the motions at

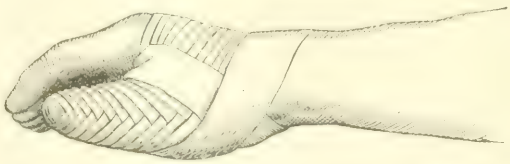


FIG. 7.—Selva's thumb-bandage applied (Med. News, Sept. 28, 1895).

the wrist joint do not interfere with the efficiency of the appliance. Provision is made by this bandage for completely covering the terminal phalanx of the thumb." Figure 7 shows this bandage applied.

"Sterilization of Catheters" is the title of an article by R. W. Frank.[1] He employs for this purpose the vapor of formalin. The catheters are placed in a glass jar, the bottom of which is perforated with holes. This jar is placed in a cylinder which contains formalin. Perfect sterilization occurs in 24 hours. The sterilization is permanent if the catheters are kept dry, and this can be accomplished by keeping them in a glass cylinder in a vessel which contains the chlorid of calcium.

[Guyon has for a number of years used sulphurous acid to sterilize woven urethral instruments. The instruments are first scrubbed with soap and water, and cleansed also on the inside, and placed, separated from contact with each other, in a hermetically sealed apparatus. They are then exposed to sulphurous acid for 48 hours. The subject of the methods of sterilization of urethral instruments is very ably discussed in an editorial in the Therapeutic Gazette, May 15, 1896.]

Pryor[2] writes an article on how to make **iodoform-gauze.** The fine gauze is sterilized by steam and then dried. After drying it is soaked in a 20% ethereal solution of iodoform for about 10 minutes. It is then wrung out, the gauze is placed in a basin covered with a towel and left for about 12 hours in a warm room, by which time the ether will be found to have completely evaporated. The gauze is now of a greenish-blue color, and will show free iodin if tested with starch. In this state it is not fit for use. It must be soaked for 12 hours in a 1:4000 watery solution of corrosive sublimate. This restores the yellow color of iodoform. The gauze is now wrung out dry and preserved in glass jars. This method disseminates the iodoform in every cell of the cotton fiber. Such dressing will not poison, as the iodoform will not be absorbed. When wound discharges and blood come in contact with the gauze it again becomes greenish blue by the setting free of iodin, so the dressing remains sterile even when saturated. The avoidance of the use of glycerol

[1] Berl. klin. Woch., No. 44, 1895.

[2] N. Y. Med. Jour., May 18, 1895.

is a great advantage, as serous exudation is not produced from the walls of cavities. Re-dressing is necessary at intervals 3 times as long as when ordinary iodoform-gauze is employed. It is nonirritant, it is antiseptic, and remains sterile even when completely soaked. He states that he uses a piece 5 yards long and 1 yard wide in the puerperal uterus. To obliterate the pelvic cavity he uses a piece 16 yards long and 4 in. wide. After resection of the sacrum he uses a piece 9 yards long and 4 in. wide. He has used this material for 5 years, and in nôt one case has he seen poisoning ensue.

Hans Vollmer[1] advocates the **sterilization of catgut** with formalin. This method was first advocated by Kossman, who soaked the catgut in a 2% watery solution of formalin for 24 hours, and then kept it in a .5 of 1% solution of the same agent. Vollmer has modified the process of Kossman. He cuts the raw gut the length which is desired, wraps each piece singly in filter paper soaked in a 2% solution of formalin for 24 hours. The catgut is dried at a temperature of 140° F., and the gut preserved dry until needed, when it should be soaked for a few minutes in a sterile fluid. Saul[2] advocates a method of sterilizing catgut which is based upon the studies of Repin and others. He determined that the following mixture was the best in which to boil the gut: 85 parts of ethyl-alcohol, 5 parts of liquefied phenol, and 10 parts of distilled water. He boils the catgut in this fluid in an apparatus which maintains the solution in its concentrated form and prevents very high pressure, and maintains the boiling point at the same degree. It is boiled for 15 minutes, which boiling completely sterilizes the catgut and in no wise injures its strength. [We have used during the year with much satisfaction the palladium catgut of Johnston, the preparation of which was set forth in the *Year-Book* for 1896, p. 340.] Clark[3] advocates in very strong terms the sterilization of catgut by cumol after the method of Krönig. Clark states that a great many methods of preparation are unreliable, and that outbreaks of infection have been traced not infrequently to the catgut used in cases. Koch showed us that commercial catgut as it is received from the manufacturer is rarely infected with pyogenic organisms, which accounts in a large measure for the absence of infection following the use of catgut prepared by even questionable methods. Hence many surgeons, losing sight of Koch's observation, claim to obtain satisfactory results from the employment of catgut which is open to the gravest objections from a bacteriological standpoint. In 1879 an outbreak of infection occurred in the service of Zweifel which was traced by Koch to the suture material, and Zweifel's strong prejudice against the Listerian method of sterilization by carbolized oil caused a large number of surgeons to abandon catgut. Kocher in 1881 introduced juniper oil as a sterilizing agent, but so many cases in his hospital became infected that he published an article against its use in any form, the article being termed "Fort mit dem Catgut."

In January, 1893, an epidemic of infection occurred in Kelly's wards in

[1] Centralbl. f. Gynäk., No. 46, 1895. [2] Berl. klin. Woch., Jan. 13, 1896.
[3] Johns Hopkins Hosp. Bull., Mar., 1896.

the Johns Hopkins Hospital which he believed to be due to catgut prepared by boiling in alcohol under pressure. Unfortunately, the whole supply of suspected catgut was used up in the last infected case, and in consequence bacteriologic proof could not be obtained. But Kelly was so firmly convinced that the catgut was the infecting agent that he discarded catgut and for two years relied entirely upon silk. A great number of chemic methods of sterilization have been suggested, but all are open to the objections of either failing to render the catgut harmless or weakening its strength or so impregnating it with irritants that it acted as a local irritant when placed in the tissues. Unquestionably, the most perfect means of sterilization for surgical purposes is heat. Until 1888 it was considered impossible to raise any form of animal ligature to a temperature sufficiently high to render it sterile without making it brittle. But in the above-mentioned year Reverdin and Benckisser brought out methods of sterilizing by dry heat. Reverdin states that it is not the oil in gut, but the hygroscopic water, which causes it to become brittle when heated. After this water is driven off by dry heat at a temperature of 70° C., a temperature of 150° C. can after this be employed without weakening the gut. A complicated apparatus is necessary, consisting of the hot-air oven and the thermoregulator. After these two investigators others sought for a liquid which has a sufficiently high boiling point to sterilize catgut. Brunner found that the boiling point of xylol was 136° to 140° C., and adopted this as the sterilizing agent, but Krönig found spores present in catgut which were more resistant than anthrax spores, with which Brunner had experimented, and these spores require a greater temperature for their destruction than can be obtained by boiling xylol. Krönig found that cumol, a hydrocarbon compound, had a boiling point of 168° to 170° C., and he substituted it for xylol. Krönig's method is as follows: 1. Roll the catgut into rings; 2. Dry it in a hot-air oven or over a sand bath for 2 hours at 70° C.; 3. Heat it in cumol to a temperature of 165° C. a little short of the boiling point for 1 hour; 4. Transfer to petroleum benzene for permanent preservation. A bacteriologic study of this method made by Dr. Clark proves that cumol perfectly sterilizes the catgut, but that the transference to benzene is open to serious objections, because benzene is not germicidal.

[In spite of Koch's observation that commercial catgut rarely contains pyogenic organisms, Lowenstein and others maintain that it often does.[1] Kocher has never returned to catgut. Within a year he has presented a record of goiter-operations. This record shows that primary union was obtained in 35% of the cases when catgut was used, and in 85.7% of the cases when sterile silk was used. He has now abandoned aseptic sutures, uses silk which has been antisepticized by an alcoholic solution of corrosive sublimate, and invariably obtains primary union. Halsted and other operators use silk, and they make out a strong case. In regard to the preparation of catgut by dry heat, Rydygier's method of employing it is said to entirely prevent brittleness. This method is in use in the Cracow clinic.

[1] Arch. f. klin. Chir., Bd. 1, Heft 21, No. 95.

The gut is wrapped in filter paper and placed in a cool oven, which oven has openings at the top. The oven is gradually heated to between 70–80° C., is kept at this temperature for half an hour, when the temperature is raised slowly to 120° C. For half an hour the temperature is caused to oscillate between 120° and 130°, and is then slowly raised to 160°, and caused to oscillate for half an hour between 158° and 163°. The oven is then allowed to cool (A. J. Richer). This method is efficient, but long and troublesome. We have tried cumol catgut and find it strong, smooth but not slippery, perfectly aseptic, and entirely reliable.]

Binnie[1] sets forth a method of **preparation of chromicized catgut.** It is an old method modified in many details. The catgut is cut into lengths of from 4 to 8 feet, is washed in soap and water, and each length is wound on a glass reel. It is placed in a 1% watery solution of chromic acid, and left in this from 4 to 6 hours, and this solution is strained off through aseptic gauze. A large quantity of sulphurous acid is then poured over the catgut, and the sulphurous acid is strained off after 12 hours. The acid is now replaced by a 2% solution of salicylic acid in commercial alcohol, and the gut in the salicylic-acid solution is placed in a water bath and boiled for 15 minutes. The alcohol reaches a temperature of 175° F. when the vessel is open, but if the stopper is applied loosely a higher temperature may be obtained. If the bottle is closed by a very loose plug of cotton, the temperature can be raised to 189° F. These ligatures are now placed in small sterilized bottles with rubber stoppers, or bottles are filled with salicylated alcohol, and after being filled are again boiled in a water bath for a few minutes and the stoppers pressed home.

Arangino[2] advocates the use of **parietal peritoneum** as a material **for sutures and ligatures.** He takes the peritoneum of horses or cattle, cuts it into strips, twists the strips into cords, and dries them for 4 days. He treats them with ether to free them from fat, soaks them in a 2% solution of mercuric chlorid and alcohol, and keeps them in a weak solution of mercuric chlorid.

A preparation known as **cutin** is recommended by Lusteck[3] as a substitute for silk or catgut. It is prepared from the gut of cattle by removing the serous and mucous membranes from the muscular layer and digesting this layer in 20% pepsin solution. The membrane is treated with trioxybenzoic acid and hydrogen dioxid. Antiseptics may be added before we harden it. This preparation is soft, smooth, can be absorbed, and can be sterilized by the use of dry heat.

Marcy[4] read a paper upon **"The Buried Tendon Suture"** before the Southern Surgical and Gynecological Association. He was the first to suggest this suture, advocating catgut in 1870 and tendon in 1880. [There can be no question that these sutures constitute an important addition to the materials of surgery, and that they are superior to any other materials hitherto

[1] Kansas City Med. Index, June, 1896.
[2] La Clin. Chirurg., Aug., 1895.
[3] Aerzte Rundsch., 1895, v. p. 440.
[4] Therap. Gaz., Apr., 1896.

employed for like purposes. Our chief experience with the buried tendon suture has been in the radical cure of hernia, and in these operations it is invaluable. We have also employed it to hold portions of bone in contact, especially after fracture. We strongly object to keeping it in any oil whatever, and prefer to keep it in alcohol. No oil is certainly sterile.]

Colombini [1] discusses **the local action of salol.** He states that in the presence of alkali or of living tissue salol breaks up into salicylic and carbolic acid, and we get from these acids in this nascent form antiseptic action without irritation effect. A good solution for salol is vaseline, and the combination of salol and vaseline does not irritate the cutaneous surface near inflamed ulcers. This remedy, the author maintains, will be very valuable as a non-irritant antiseptic. [We have used the ointment, and with some success, upon eczema and ulceration, and have employed the powder as a dusting powder for wounds, ulcers, cutaneous surfaces, and sinuses. It does not seem to be as efficient as acetanilid. The claim that it is nonirritant is certainly true. The ointment of salol and vaseline has been used to anoint bougies, but we do not approve of vaseline for this purpose, as portions of the ointment may be left in the bladder, and a case has been reported of a vesical calculus with a cosmoline nucleus.]

Loretin is a new antiseptic which is discussed by Herbert Snow of London.[2] This agent was discovered by Claus of Freiburg. It is a bright yellow, odorless, crystalline powder but slightly soluble in water and alcohol. Ammelburg proved loretin to be a powerful germicide, much superior to iodoform. Schnesinger has used loretin extensively, and with great benefit in burns and all sorts of operations (herniotomy, resection of upper jaw, etc.), and has never seen toxic symptoms. It does not irritate the skin at all; the scar from a burn dressed with loretin is slight. Loretin is used as a dusting powder (alone or mixed with starch, chalk, or magnesia), as collodion (2–10%), in pencils of cocoa butter (5–10%), in ointment (5 or 10%) with vaseline or lanoline, in solution (1–2% of free acid or 1–2% of sodium salt), as gauze impregnated with the calcium salt. Snow's own experience is confined to the powder, which he uses unmixed. It does not irritate in the slightest the skin or a granulating wound. It instantly destroys the fetor of the most malodorous sore. Insufflated into a large wound, it will prevent suppuration. Snow has used it in 60 cases, mainly operations upon the breast and axilla, and considers it an ideal antiseptic and deodorant. It is absolutely nontoxic.

Among a large number of **new antiseptics** which have been suggested we would name the following:

Oxycyanid of mercury, first recommended by Chibret.[3] It is used in the strength of 5 : 1000. It does not attack the hands nor injure instruments, and is quite as efficient as corrosive sublimate. It must not be used to wash out cavities if there is any chance of fluid remaining.

[1] Brit. Med. Jour., 1895, No. 1818, p. 71. [2] Ibid., Dec. 2, 1895.
[3] Monod and Malgaigne in Progrès méd., Oct. 26, 1895.

Fluorid of sodium[1] is used by Blaizot to cleanse the mouth and skin; the strength solution employed is $\frac{1}{2}$ to 2%. It is used for vaginal injections and for the treatment of erythema neonatorum. Because of its power to dissolve albuminous substances, Luffier of Paris uses it in certain cases of cystitis.

Calcium permanganate[2] is not toxic, is not caustic, and is claimed to be as certainly germicidal as is mercury chlorid. It is claimed to be 100 times more active than potassium permanganate.

Argonin[3] is not irritating to mucous membrane, does not penetrate the tissues deeply, is not precipitated by albumin or sodium chlorid, and will kill gonococci.

Lannaiol[4] is an iodocresol, and is used as a substitute for iodoform. The writers claim that it is free of odor, nonpoisonous, and unirritating.

R. iodocarbazol.[5] This compound is insoluble in water, but is soluble in ether, alcohol (hot), chloroform, and acetic acid.

Lignosulphit[6] is a liquid obtained as a side product during the manufacture of cellulose from pine wood.

Parachlorophenol[7] can be used in 1 and 2% solution as a substitute for mercury.

Veratrol[8] is an oil resembling guaiacol in some of its actions, lowering febrile temperature when applied to skin, and being much less toxic than guaiacol.

Sugar[9] is advised as a useful antiseptic in emergencies. Concentrated saccharine solutions prevent the growth of saprophytic and pathogenic organisms. Wounds can be dusted with sugar or dressed with sugar contained in bags. [The best emergency antiseptic we learn of is mustard, a material the great value of which has been set forth by Roswell Park (see *Year-Book* for 1896, p. 339). Park says scrub the hands for 5 minutes with a mixture of soap, cornmeal, and mustard flour, and the hands will be rendered absolutely sterile. Park invariably uses mustard to prepare himself for an operation. It will also remove the odor of decay and the smell of iodoform. Park was one of the first to try sugar and mustard.]

Jaworski of Warsaw contributes an article upon **steam as a hemostatic and antiseptic agent.** He states that it is cauterizing, anesthetic, deodorizing, hemostatic, disinfecting, and aseptic. It checks parenchymatous bleeding. The experimenter removed portions of the liver, of the kidney, of the lung, and of the uterus in animals without loss of blood. He has used it in man in resection of the knee, removal of a mammary gland and various tumors, amputation of the cervix uteri, removal of myoma of the uterus, and many other operations. He uses an apparatus for distilling water. The steam

[1] N. Am. Pract., July, 1895. [2] Bordes. méd. Press and Circ., 1895, lx. p. 83.
[3] Mayer in Nouv. Rémed., 1895, xi. p. 343.
[4] Kraus and Chevier in Pharm. Centralbl., 1895, xxxvi. p. 510.
[5] Classen in Pharm. Zeit., 1895, xl. p. 546.
[6] Pharm. Centralb., 1895, xxxvi. p. 423. [7] Girard in Sem. méd., 1895, xv. p. 206.
[8] Summont and Vennersch in Med. Week, 1895, iii. p. 383.
[9] Zeit. f. Krankenpf., 1895, xvii. p. 263.

is applied for half a minute to a minute. He considers this agent expressly valuable in gynecologic operations. [It is hard to control, and we cannot limit the extent of damage done to the sound tissues.]

Adhesol is a form of surgical dressing strongly recommended by Dufau.[1] [What special advantage adhesol possesses over collodion we do not know. The preparation is far more complicated than is that of collodion, and we do not believe a whit more efficient.]

Sänger[2] of Leipsic opposes the use of **dry sponges** in abdominal operations, because they injure the peritoneum mechanically, and as a consequence are liable to give rise to adhesions. He wrings sponges out in a solution of sodium chlorid and calcined sodium carbonate. This solution was originally recommended by Tavel. It consists of 7.5 g. of sodium chlorid, 2.5 g. of calcined sodium carbonate, and 1 liter of water. [The prevention of adhesions is a matter of great importance, but as yet our success in prevention is very limited. Sänger's proposition is entirely reasonable, and promises valuable results.]

ABSCESSES, SUPPURATION, SEPSIS, AND ERYSIPELAS.

Erysipelas.—Langsdorff[3] advocates the treatment of erysipelas by the local use of strong alcohol. Soft compresses of linen are saturated with alcohol, are covered with gutta-percha tissue, and are renewed every 15 or 20 minutes. In facial erysipelas cotton is used instead of linen, because it more readily adapts itself to the irregular contour. The redness and tension will often disappear within 12 hours, and after they have disappeared the intervals of application may be increased. Recovery is the rule in 2 or 3 days. Considerable dryness of the skin is apt to follow recovery, and for this lanoline is very valuable. [The great number of plans which have been proposed for treating erysipelas is proof that no one plan is entirely satisfactory. Most of the plans are complicated, and yet neglect an essential procedure. A seat of primary infection should always be sought for: it may not be discovered, but if it is discovered, it must be thoroughly asepticized. A very old plan of treatment holds its own as one of the best that can be employed; that is, every day paint the red area and the sound skin adjacent to it with tincture of iodin diluted with an equal bulk of alcohol, and then cover the part with lead water and laudanum. A bandage is then applied. The iodin is antiseptic, and the lead water and laudanum is astringent and anodyne; evaporation produces cold and the bandage exercises compression. Von Nussbaum's method—viz. the use of ichthyol—is certainly efficient. Constitutional treatment must never be neglected.]

The origin of the stitch-abscess is discussed by Lauenstein.[4] He has long been studying the occurrence of infection after aseptic operations, and has found many instances which could be explained only by believing that the infection was due to sutures or ligatures. He made bacteriologic

[1] Semaine méd., 1895, xv. p. cxxii.
[2] Centralbl. f. Chir., 1896, p. 191.
[3] Ibid., 1895, No. 8, p. 189.
[4] Beiträge z. Centralbl. f. Chir., No. 27, 1895.

studies in the case of 216 sutures and ligatures, and in these he found 64 which contained bacteria. He came to the following conclusions: 1. That clinical observations show that cases of suppuration do occur which originate from the catgut employed in the wound; 2. It cannot be certainly said in any instance that the catgut has been the cause of the infection; 3. It is absolutely certain that the alleged sterile catgut of commerce often contains germs capable of development; 4. So long as this is the case catgut cannot be free from suspicion of causing infection in wounds. [Koch, the reader will recall, was of the opinion that commercial catgut rarely contained the organisms of suppuration, but Lauenstein differs from him. Kocher strongly affirms his belief that catgut is a frequent cause of infection: in his goiter-operations he had 65% of infections when he used gut, and has had only 15% since using silk. Halsted and Marcy both believe that catgut is frequently infected. That gut can be made sterile is certain; that it is frequently very badly sterilized is equally certain. We think the great percentage of infections obtained by Kocher is an indictment of his method of sterilization.]

Mammary Abscess.—Spencer[1] contributes a note upon the prevention of large mammary abscess by the expression of the milk. He tells us that in the operative treatment of these cases generally more than one incision has to be made, the sinuses are very long in healing, and in some cases the removal of the breast has been demanded. He tells us that in instances in which the breasts are extremely distended, lactation having been recently interrupted, suppuration will be prevented by the forcible expression of from ½ to 1 pint of milk. [In lactating women great care of the nipple will usually prevent the formation of breast abscess, as the causative organisms usually enter by means of the milk ducts. It is conceivable that these abscesses could arise in septicemia by infection of the blood stream, but this mode of origin is rare. Most observers teach that they are rarely due to lymphatic absorption from areas of nipple infection, because the lymphatics from the nipple are superficial to the mammary gland and run directly to the axillary glands (W. Watson Cheyne). An area of infection at the exit of the ducts can eventuate in the spread of organisms into the ducts (not an active absorption).] After squeezing out the breast nursing should be absolutely prohibited and the arm should be bandaged to the side. Spencer orders the women to frequently foment and squeeze the breast, and to take potassium iodid for a few days.

Sheild[2] contributes an article of great value upon the Causation and Treatment of Mammary Abscess. He feels assured that operative treatment as ordinarily conducted is not satisfactory. As regards the causation of these affections, though everybody associates them with lactation, yet instances occur which are quite inexplicable on these grounds, and it is here that special diagnostic difficulties arise rendering the subject of immense importance to the surgeon. When we consider the ordinary form of acute mammary abscess, figures clearly show its close relation to lactation. In a study of 200 cases admitted into St. George's Hospital, 169 were directly due to lactation and

[1] Lancet, Feb. 29, 1896.

[2] Ibid., May 2, 1896.

referred to sore nipples; 31 were due to other causes, and of these 8 were directly attributed to the blood; 1 was due to necrosis of the rib; and 22 were due to uncertain causes, but of these in 5 instances the abscess originated on the site of former abscesses, and in 3 there was suspicion that the disease was tubercular. As regards the time after parturition that a mammary abscess occurs, there is the greatest variability. Some of the cases occur as early as the 1st, others not until the 14th month. Birkett assumes that one half of the cases are associated with defective or sore nipples. Sheild believes that the average is far higher than this. In fact, he has never seen a case of acute mammary abscess in a young woman without being able to observe by the aid of a lens breaches of surface in the vicinity of the nipple by which organisms might effect an entrance into lymphatic channels. He was greatly struck with the infrequency of mammary abscess in Queen Charlotte's Lying-in Hospital; the cause of this infrequency was the great precaution taken by the physicians to ensure cleanliness of the nipples and of the infant's mouth. This is the first important proposition of his paper—that in the huge majority of cases acute mammary abscess, whether arising during lactation or not and in either sex, is due to absorption by the lymphatics of organisms which enter abrasions on the nipple or areola. [Most observers deny this on anatomic grounds (see previous paper, p. 212).]

Nocard produced tubercular mammary abscess by injecting tuberculous virus into the milk-ducts of a lactating goat, and Boissard in 1893 stated positively that milk-ducts could be infected by streptococci and staphylococci. Of course it is always open to doubt in these cases that some breach of surface does not really exist, and although the experiments of Nocard proved conclusively that infection by the ducts is possible, it certainly is not common. For 3 years Sheild has closely examined a number of cases of mammary inflammation and abscesses without finding a single case which he could certainly attribute to infection through the milk-ducts themselves, and he and Sherrington performed some experiments upon lactating goats and lactating rabbits which were purely negative in results. What the effects of gonococci upon the milk-ducts of the human subject may be it is impossible to prove experimentally, but one would imagine that purulent inflammation would readily result. Purulent inflammation of the milk-ducts must of course produce serious results in the infant. [Sheild makes out a strong case in favor of lymphatic absorption, but to our mind does not surmount the anatomic difficulties to accepting this view.]

The influence of blows in causing abscess of the breast is well known, and suppuration in the male breast is usually attributed to this cause. In 12 cases studied by Bryant, 8 were attributed to pressure or injury. In such instances it seems quite plain that a communication is established between the area of tissue containing extravasated blood, the resistance of which is impaired, and the external parts through the torn or injured ducts. Hence organisms may enter and produce ill effects. Abscess in the breasts of infants is quite common and is largely a preventable malady. It is commonly devel-

oped during the manipulations of ignorant nurses, who pull or rub the nipples until a breach of surface is effected. Suppuration in connection with new growths is extremely rare. Abscesses may be found in the neighborhood of ulcerated carcinoma. In very exceptional cases the cysts of sarcoma or adenoma may contain pus. Should they be artificially inflamed or inoculated with septic material by a dirty trocar, suppuration is not uncommon. In the days when caustics were employed to remove cancers of the breast abscess and cellulitis often arose. In nearly all our text-books abscesses are divided into the supramammary, the intramammary, and the submammary. In the supramammary the pus forms beneath the skin and the areola. The submammary form is extremely rare, but may arise as a sequence of caries of the rib or of empyema; often abscesses supposed to be submammary are really in the deeper part of the gland itself. A great majority of abscesses are in the substance of the breast. Great havoc is wrought by untreated suppuration in the breast. The abscess burrows and branches and forms pockets and recesses, multiple points, and sinuses. It very rarely happens that there is a fatal result from septicemia. [One of the editors (DaCosta) has seen a fatal case within one year.] In some cases destruction has been so great that amputation has been resorted to. Abscess of the breast commonly becomes constricted where the pus has burrowed through fascia or fibrous septa, the abscesses assuming in consequence an hourglass shape. This condition was long ago described by Velpeau. It shows itself as a subcutaneous swelling, and if it is simply treated by an incision radiating from the nipple, the discharge will continue indefinitely, because the main pus-cavity has not been freely drained.

Sheild considers the **influence of tubercle** in producing abscess of the breast. Sir Astley Cooper many years ago alluded to scrofulous tumors in the breasts of single women, which abscesses contained thin, watery, or curdy pus. The axillary glands are likely to become involved. Payne has related a very remarkable case of tuberculous abscess near the nipple of a child who subsequently died from general tuberculosis. The important question of the transmission of tubercle by a mother to her child is believed by many to be possible, though some think that Colles's law holds as true in tubercle as it does in syphilis. Powers has stated that there are 35 authentic cases on record of primary tuberculosis of the breast. Sheild has met with 6 cases. [Catelain has within the past year reported 2 additional cases, in both of which the axillary glands were enlarged. In 1 case he proved the diagnosis by injecting guinea-pigs with some of the caseous material obtained by the removal of the breast and the clearing of the axilla. The animals developed tuberculosis. Powers' article will be found in the *Year-Book* for 1896, p. 176. Gaudier and Peraire report 3 cases,[1] and claim that this brings up the total number of reported cases to 42. All 3 were recognized by finding the bacilli. Reclinck says the diagnosis rests upon the histological examination and the finding of bacilli. In cases of circumscribed disease he extirpates the diseased area; in cases with axillary involvement he operates as for cancer.]

[1] Rev. de Chir., Sept., 1895.

It should be remembered that an acute mammary abscess is a preventable disorder if the medical attendant is careful as to the cleansing of the nipple and the mouth of the child, and if he is aware of the importance of attention and proper care of the nipples previous to marriage. In certain cases of maldevelopment of the nipples fissures or ulcers will arise, and in such persons abscess may occur in spite of the best care. Sheild then goes on to speak of the purely operative treatment of acute abscess. Of course the child must be weaned, the breast must be supported, the secretion of milk must be arrested by the administration of drugs, or the fluid must be expressed by massage and the exhausting pump. Beale advocates opening the abscess with a trocar and cannula and applying the exhausting bottle to the aperture. Sheild thinks such a treatment might be applicable to a small superficial abscess, but would oppose using it in deep-seated collections of pus. He is absolutely sure that the old treatment of a free anterior opening radiating from the nipple is essentially wrong. It leaves a scar on the front of the breast, and it opens the abscess-cavity in a position unsuitable for drainage. As a consequence these cases frequently are subjected to several operations until drainage-tubes are seen projecting through various openings.

Sheild in conclusion asserts his belief that breasts are removed too frequently for these affections, and that free drainage in the dependent position, with erasion and flushing, will in the majority of cases obviate the necessity of more serious operation. [We consider that Sheild's article is sound, practical, and conclusive. The old method of operating, by linear incision, is often, as every surgeon knows, extremely unsatisfactory. Gibson insisted years ago that the opening should always be at the lower portion of the breast. Sheild's method is his own, and commends itself to our judgment as a highly valuable suggestion.]

Lannois[1] describes **pyelophlebitis and abscess of the liver resulting from typhoid fever,** the bacillus of Eberth being discovered in the pus of the abscess. He tells us that abscess of the liver as the result of typhoid is extremely rare, and occurs in 1 out of 3680 cases. He divides abscess of the liver resulting from typhoid into three varieties: 1. Metastatic abscesses which take origin from some external area of suppuration; 2. Abscesses from typhoid ulcers of the bile passages; 3. Abscesses due to pyelophlebitis. The case he reports belongs to the latter class. The man was 28 years of age, and the attack of fever had passed away. He had been 3 days free from fever when he was seized with a chill, fever, and the evidences of pleurisy at the base of each lung. The abdomen was distended and there was great pain in the right hypochondriac region. The case was looked upon as tubercular peritonitis because of the pleurisy and the abdominal distention. The patient died in 3 days. The autopsy showed healed ulcers in the small intestine and some partly healed ones. There were antemortem clots in the portal vein, the splenic vein, and the inferior mesenteric vein, and the latter contained a number of abscesses. The pus when examined contained a variety of organ-

[1] Rev. de Méd., Nov., 1895.

isms, one of which strongly resembled the typhoid bacillus except that it liquefied gelatin. The author maintains that it was the typhoid bacillus, and the liquefaction occurred because of the impure culture.

[The *Year-Book* for 1896 shows that the gall-bladder may be attacked by typhoid bacilli.[1] It seems probable that Lannois is correct, and that the organisms were typhoid bacilli.]

Hayden[2] advocates the injection of iodoform ointment in **the treatment of suppurative adenitis of the groin.** He reviews the various surgical procedures which have been suggested for this condition; for instance, aspiration and iodin injections, incision and irrigation with iodin, incision and packing with iodoform. Helm cleansed the parts, anesthetized by ether-spray, drew off the pus with a hypodermic needle, washed out the abscess-cavity with a weak solution of phenol, filled the cavity with iodoform in glycerol, withdrew the needle, closed the puncture with collodion, and applied a dressing and a bandage. Helm substituted after a time oleic acid for the glycerol, and finally iodol for the iodoform. In 1889, Von Eichstoff presented the records of a number of cases which he had treated by injecting iodoform and ether. In the same year Fontan described the treatment of buboes by injections of iodoform-vaseline. He maintained that the average time of cure under the influence of this method was from 6 to 7 days. He advises that the parts be shaved and cleaned, the bubo opened with a lancet, and the pus forced out, the abscess-cavity irrigated with dilute Van Swieten's fluid, iodoform-vaseline injected in a glass syringe which has previously been warmed in hot water. A cold wet dressing is applied in order to solidify the ointment at the opening. In some few cases a second injection is necessary. In 1893, Otis strongly advocated the use of this method. Hayden has employed Fontan's method with great success, and strongly advocates its use.

Except in 2 cases, suppurative action and pain ceased after 1 injection. In these cases the injection had to be repeated because of slight reaccumulation of pus. This method should only be employed when the glands are thoroughly broken down, so that the iodoform may come in direct contact with all infected regions. This method will not succeed in every case, but it has many advantages in most cases over more radical procedures. The patient is not confined to bed; he is not required to take an anesthetic, and a very slight scar remains. If after one or several injections this method fails, an incision may well be made. [We have succeeded in some cases, but have more often failed. We usually apply treatment before the glands are entirely broken down; that is, a clean incision through sound skin, extirpation, and antiseptization. Incision made through sound skin leaves but little scar, especially if closed by Halsted's subcuticular suture.]

Richardson[3] advises the use of sugar in the dressing of **furuncles and carbuncles,** and maintains that it brings about rapid softening. He dusts it freely in the carbuncle and then applies flaxseed poultices. [The flaxseed

[1] Williams and Sheild and Gilbert and Girode, p. 239.

[2] Am. Jour. Med. Sci., Nov., 1895.

[3] La Sem. méd., xvi. p. xxvi., 1896.

poultice is an eminently undesirable application, and sugaring a carbuncle is a waste of time. The knife should be used, and at once, after the method advised on page 219 in the note upon Harding Tompkins's article.]

Lamarchia[1] has invented a delicate instrument to recognize **fluctuation.** It consists of a thin metal disk with a central opening. This disk is held by edges between the middle finger and thumb of one hand and pressed upon the surface. The tip of the index finger is lightly applied to the surface through a central opening, while the other hand is employed to give a tap upon the surface. He claims that the slightest wave can thus be recognized and that false fluctuation can be thus certainly excluded.

Galeazzi[2] has made a number of experiments upon animals to determine **the effect of shock upon the predisposition to septic infection.** Many writers have claimed that shock predisposes to it, but his experiments would indicate that shock does not favor infection, and he thinks it strange that the view should ever have been held because of the slowness of absorption which exists in shock. [In spite of the positive statement of Galeazzi, we are not prepared to abandon the usual view without positive evidence that it is wrong.]

Berlin[3] in reporting to the Société de Chirurgie the case of a woman who developed violent sepsis after a vaginal hysterectomy strongly advocated **the treatment of sepsis** by intravenous injections of artificial blood serum. In this case violent sepsis appeared 3 days after the operation, and on the fourth day the patient was apparently dying. She was given an intravenous injection of about 1 pint of artificial blood serum, and shortly afterward she was given almost 2 pints. Marked cyanosis was observed and the symptoms became very grave, but in a short time decided improvement began and the patient recovered. [Ségond has used injections of artificial serum for 4 years, and strongly approves of them. Monod and Michaux speak in favor of this agent. Lenier says the serum can be used subcutaneously as well as intravenously, and should be combined with bloodletting. These injections stimulate the kidneys in postoperative anuria, of which we ourselves have had a marked example recently.]

Lejars[4] has reported 3 cases of septic infection in which artificial serum was injected, and 2 of the cases were saved. An abstract of the article will be found in the Practitioner.

In 1 case Lejars gave 3 subcutaneous injections in 1 day, and the same the next day, 500 grams being given at each time. On the third day 1½ liters were given. For several days 2 liters were given daily, and they caused profuse discharge of urine and feces. In 7 days 26 liters were given. Lejars thinks this agent acts by causing the extrusion of a great amount of toxins and microorganisms by means of diuresis and diarrhea. Sometimes during the injection the patient has transient abdominal pain and dyspnea. Hayem's serum was used. It consists of sodium chlorid, 5 grams; sodium sulphate,

[1] Gaz. med. di Torino, June 20, 1895.
[2] Gaz. degli Ospedali, 1895.
[3] Therap. Woch., No. 21, 1896.
[4] La Presse méd., Jan. 1, 1896.

10 grams; distilled water, 1 liter; or about 40 gr. of common salt and 80 gr. of sulphate of soda to the pint.

Harding H. Tompkins[1] comments on the statement of Mr. Maberley,[2] who maintains that **carbuncles** heal better, more quickly, and are subject to less sloughing when they are uncut, and maintains that pressure is a valuable aid to treatment. Tompkins says that the great disadvantage in applying pressure is the difficulty in application and the pain. He advocates the application of pressure by painting all over and beyond the inflamed area with collodion in graduated thicknesses toward the center, and securing outlets for pus and thorough disinfection by boring into the center from several points by a charred lucifer match soaked in pure carbolic acid. The results, he maintains, have been extremely favorable. [We believe strongly in the necessity for incision. In the old days a crucial incision was made and a flaxseed poultice was applied. It is true that in some subjects this procedure was followed by an intensification of the constitutional symptoms and by a spread of the suppuration into the healthy tissues which were opened by the incisions. The introduction of antiseptic methods has profoundly altered the course of carbuncles. The surface should be cleansed. The carbuncle should be opened by crucial incisions, sloughs and infiltrated tissues should be removed by scissors and the curet, the raw surface ought to be seared with pure carbolic acid or dusted with iodoform, and the wound should be dressed with hot antiseptic fomentations. Some severe carbuncles require the application of the actual cautery or even excision of the entire area. (See under the heading Carbuncle in Warren's Surgical Pathology and Therapeutics.)]

Marmorek[3] has produced an **antistreptococcus serum** which he applied to cases of erysipelas. He used it upon 306 cases: 165 of these were severe cases, the mortality was 1.63%; and, as some of these deaths were due to causes apart from the disease, the real mortality was 1.2%. When the weaker serum was employed the mortality rose to 4.82%. The average mortality of its use was 5.12%. After the dose improvement in both general and local symptoms was noted in from 5 to 12 hours, and the temperature came to normal in 24 hours. If at the end of 24 hours the temperature was high, the injection was repeated. Patients treated with serum never developed albuminuria, and albuminuria when already present disappeared in from 24 to 48 hours after the commencement of serum injections. The dose varied from 10 c.cm. to 20 c.cm. More than 100 c.cm. were never given in 10 days. He claims very admirable results in the treatment of puerperal fever, especially when the infection is purely due to streptococci.

[Antistreptococcus serum has been used also in cellulitis, and has had, it is claimed, a beneficial action. (See Brit. Med. Jour., Dec. 7, 1895.)]

Dubreuilh[4] reviews this subject. An abstract of Dubreuilh's article is contained in The Practitioner, Mar., 1896.

Chantemesse publishes the following table:

[1] Brit. Med. Jour., Mar. 21, 1896.
[2] Ibid., Feb. 15, 1896.
[3] Ann. de l'Inst. Pasteur, Nov. 7, 1895.
[4] Jour. de Méd. de Bordeaux, Jan. 26, 1896.

	Patients.	Deaths.	Death-rate, %.
Number of cases	1055	34	3.22
Purely symptomatic treatment	145	5	3.45
Symptomatic warm baths	409	16	3.01
Serum of medium strength	297	5	1.70
Weak serum	107	7	5.54
Very strong serum	97	1	1.03

Local improvement in erysipelas begins in 24 hours, redness diminishing, spread ceasing, and pain abating. The fever ceases on the first day.

In puerperal fever as much as 100 c.c. of serum has been used in doses of 20–25 c.c., repeated once or even twice a day.

[It is certain that a person recovered from suppuration is in no degree protected from a subsequent suppuration. On the face of it, it seems improbable that there is any such thing as immunity natural, or acquired, to pyogenic infection. The real value of this treatment can be determined only by more extended observation conducted with honesty, care, and scientific scepticism.]

TUBERCULOSIS.

Tuberculosis of hernia is discussed by Tenderich,[1] who reports 3 cases, in 2 of which the hernial sac contained only serous fluid and the peritoneum of the abdomen was tuberculous. One of these cases died of pulmonary tuberculosis, but 2 remained in good condition 7 months afterward. The author was able to find 22 cases of this condition reported. He quotes Bruns to the effect that the hernial tuberculosis may be primary, but that, as a rule, it is combined with general tuberculous peritonitis; 14 of these cases were subjected to operation; 3 died as the result of operation; 4 recovered from the operation, but were not subsequently traced; 4 were well between 6 and 9 months after operation, and 3 were well between 1 and 2 years after operation. Most of the cases were inguinal hernia in the male. Certain diagnosis is impossible unless symptoms exist of general tuberculous peritonitis. [Jonnesco in 1891 reported 12 cases. In 6 of these cases the sac alone was diseased, in 3 cases the contents of the sac alone were diseased, and in 3 cases both the sac and contents were attacked. He advised removal of the sac and resection of the intestine when possible; if this is found impossible, he recommended reduction of the bowel. Not a few cases have been cured by simple incision, just as peritoneal tuberculosis has been cured by celiotomy.]

Cesar[2] comments upon Bidwell's report of 6 cases of **lupus** which were treated radically. He dissents from Bidwell's statement that Watson Cheyne was the first to excise lupus and practise immediate skin-grafting. Cesar states that he did this himself 20 years ago. He thinks excision is far better than curetting, and maintains that skin-grafting is unessential. [Excision has been practised often, but it was largely abandoned through the influence of Richard Volkmann, who was a firm believer in the sharp spoon and caustics, though he occasionally practised excision, followed immediately by a plastic operation.

[1] Deutsch. Zeit. f. Chir., 1895, xli. p. 220.

[2] Lancet, Apr. 6, 1895.

Volkmann's treatment is suitable for most cases, but Cheyne's method will limit deformity.]

Isnardi[1] advocates the local use of oil of turpentine in tuberculous lesions. He uses this in tuberculosis of the skin, in fistulæ, and in abscesses, combining it with vaseline. He advises that a fistula be first curetted, and an abscess be first aspirated. He packs abscesses with sterile gauze containing equal parts of vaseline and oil of turpentine, and reports 18 successful cases. [Turpentine was years ago given internally and by inhalation in phthisis. Possibly this use of it may have suggested its employment in fistula. In the treatment of sinuses and fistulæ we have obtained the most excellent results from the local use of two drugs—palladium bichlorid and pyoktanin. In some cases we use one and in some cases the other. A report upon palladium will soon be published.]

Primrose[2] strongly advocates the early **operative removal of tubercular glands.** He says that operative procedure is restricted to the localities in which the glands are accessible. The cervical glands, the axillary glands, the inguinal glands, and the glands along the iliac vessels can all be readily removed. The glands of the thoracic and abdominal cavities are rarely suitable for operation; for instance, the bronchial glands, the mesenteric glands, and the retroperitoneal glands. The locality most frequently invaded by the surgeon is the neck. The operation must be performed with all aseptic care. Primrose prefers carbolic acid as the best form of antiseptic, and thinks there is practically no danger to life in these operations. [The dry dissector of Allis is the best instrument with which to dissect out glands. The constitutional and hygienic treatment of the patient is of the first importance, as Treves emphasizes. (See next article.) Treves has also shown that all tubercular glands do not require excision. (See next article.) If excision is employed, it must be thorough; the deep cervical glands must be removed as well as the superficial glands; the jugular vein must be completely bared from skull to clavicle, and sometimes the sterno-cleido-mastoid must be divided, although this is rarely necessary. If it is divided, it should subsequently be sutured with catgut. In removing lymphatic tuberculosis the surgeon must be careful not to cut the 7th nerve. Spengel has in 2 cases extirpated the pelvic glands for tuberculosis. The inunction of guaiacol is of great value in many cases of local tuberculosis.]

Treves[3] presents in his well-known emphatic style **the surgical aspect of tuberculosis.** He tells us that it was assumed less than 50 years ago that tuberculosis was beyond the province of the surgeon. The surgeon was permitted to take a languid interest in the disorder called scrofula, although his powers for good did not extend beyond the application of iodin with a paint brush. The laying on of iodin served to replace the laying on of hands which had previously given the kings the privilege of curing this affection. Scrofula was a very convenient disorder, being the cloak to cover a multitude

[1] Univ. Med. Mag., Oct., 1895.

[2] Canad. Pract., Dec., 1895.

[3] Lancet, Oct. 26, 1895.

of pathologic sins. It represented something in the blood; it had a whispered kinship to syphilis. There was about it something of the attractive romance which attaches to an obscure domestic scandal. It was like the *x* of algebra, representing a profound quantity of ignorance. Since the term tubercular crept into existence scrofula and tuberculosis began to play the part of two Dromios in a tedious comedy of errors. Treves then reviews the history of the controversies out of which have come a more accurate knowledge of the relationship of the so-called scrofula and tuberculosis. He discusses the various modes of infection, and then takes up the treatment from a surgical standpoint. He tells us that the first elements in the treatment are fresh air, sunshine, and good food. There are no drugs which are specifics against tubercle, and three-fourths of the medicines given are administered not to treat the disease, but to soothe an inherited craving in the human race for physic, which is almost as uncontrollable as the craving for drink. During the cold weather these patients should take an extra amount of fatty matter in the form of fat, butter, or cream. There is no excuse for the administration of cod-liver oil. There is no more nauseous form of fat to be found, and it does not contain any chemical quality other than that of the oil. It was originally introduced when it was considered in keeping with the fitness of things that all medicine should be nasty. If adults like this oil, by all means let them take it, but it is unkind to force it on children, who have no prejudices as to the efficacy of medicine and have not reached an age to appreciate the beauty in nastiness. The public clings to the belief that there are such medicines as tonics. Tonics are medicines which are supposed to give an individual strength. It is needless to say that no medicine can effect this. Strength cannot be poured down the œsophagus. One might as well add to the Pharmacopœia a physic the taking of which will give wealth. When there is anemia, iron ought to be administered. Arsenic and quinin are occasionally of value, and in some few instances potassium iodid is of service. When we come to the consideration of special joints, the first necessity is to place the patient under the best hygienic conditions possible and maintain the joint at rest. In hip-joint disease the thigh is not to be suddenly forced into a stereotyped position which the surgeon insists is one of rest, but which the patient knows is one of discomfort. The limb is to be gently induced into the natural position and kept there. Under the treatment of perfect rest the majority of cases of tuberculous joint disease recover. If an abscess forms in connection with the hip, and that abscess be treated upon general surgical principles, it will, as a rule, get well. A view not many years ago was maintained that as soon as an abscess appeared excision ought to be carried out. Treves dissents from this opinion. He tells us that even the excellent operation of arthrectomy, for the elaboration of which surgery is chiefly indebted to Mr. Wright of Manchester, is becoming wisely restricted in its use.

The treatment of tuberculous glands of a certain grade by complete excision is in every way excellent, but surgeons occasionally tend to run into extremes. Some few assume that excision is the only treatment for tubercular

glands, asserting that there is no other course open and that disaster will follow any delay in operation. This is pressing an admirable measure to an extreme and irrational use. Certain cases will recover, and recover thoroughly, without operation, and certain other cases are not suited for operation. In the treatment of gland diseases two matters call for early attention. The periphery should be examined and any exciting cause be dealt with. For instance, in cervical adenitis we should look for eczema of the scalp, discharges of the ear, nasal catarrh and enlarged tonsils, postnasal growths, buccal ulceration, or carious teeth. It will be of little avail to treat tuberculous glands until these peripheral conditions are cured.

As a second element in treatment the part must be kept at rest. This is usually insisted upon when the enlarged glands occupy axillary or glands of the groin, but it is very seldom urged in the neck. Yet the neck is in almost constant movement, the glands, the sterno-mastoid muscle, are subjected to continual disturbance; until the neck is fixed the great essential in treatment is ignored. In many cases the diseased glands must be removed. It will not do to be too certain that a removal will leave a fine and invisible cicatrix. Surgeons have become less radical in the treatment of tuberculous testes. The patient should be placed under as favorable conditions as possible, and when softening appears in the epididymis the parts should be incised, scraped, and packed with iodoform-gauze. The operation may have to be repeated several times, but is frequently followed by complete cure. In psoas abscess the incision should be made in the loin. Treves suggested this incision in 1884. The abscess is thus opened as near as possible to the seat of the disease. The spine can be examined over a limited area, and sometimes diseased bone can be removed. When the abscess has been evacuated sharp spoons are introduced and the lining wall of the cavity is thoroughly scraped. During this scraping the cavity is frequently flushed out with warm sterilized water. The finger is used to break down septa and to open up diverticula. When the cavity is clean it is dried with Turkish sponges on holders. A little iodoform emulsion is injected and the wound closed. In spite of contradictory reports from laboratories, clinical observation seems to render it certain that iodoform has a specific effect upon tuberculous lesions. The well-to-do patient passes his convalescence upon a spinal carriage in the open air, be it winter or summer.

In discussing tuberculous peritonitis the author tells us that in a series of 308 cases treated by celiotomy there were 74 deaths, but the mortality due directly to the operation was only 2.5%. Those cases did best in which the operation consisted of little more than free incision and in which there was neither flushing nor drainage.

AMPUTATIONS.

Page[1] presents the **results of major amputations** which were treated antiseptically in the Royal Infirmary, Newcastle-upon-Tyne, during the year

[1] Lancet, Mar. 21, 1896.

1895 and for a period of 17 years and 9 months. During 1895, 68 major amputations were performed upon 66 patients; 64 recovered and 2 died, a mortality of only 3%; 23 amputations were for injury; in 1 case a man lost a thigh and a leg; in 1 a child lost a foot and arm and a large part of the other hand. Of the 23 patients, 1 only died, a mortality of 4.3%. Amputation was resorted to 43 times for disease, and 1 died, a mortality of 2.3%. One of the deaths arose from blood-poisoning, but the patient had blood-poisoning when admitted, and amputation failed to save her life. One case of hip-joint amputation died from shock. In each operation, during the performance of the double amputations, hot saline solutions were introduced. Both these patients recovered, and life was apparently saved in each case by the transfusion. In 1 other instance transfusion was resorted to during amputation at the hip-joint. This case also recovered. From Jan. 1, 1883, to Dec. 31, 1895, 778 amputations were done, with 63 deaths, a mortality of 8%; 300 of the amputations were for injury, and 36 died, a mortality of 12%; 478 were for disease, and 27 died, a mortality of 5.6%. Of the 68 deaths which have ensued upon amputation during the last 13 years, 30 have arisen from shock and loss of blood. During 1895 transfusion was resorted to as a means of counteracting the effects of shock and loss of blood, and in every case the effect was very striking. Blood-poisoning as the cause of death after amputation has almost ceased to occur. Page believes that the injection of a hot saline solution into the veins will prevent death from shock and loss of blood in many cases, and that, in fact, the mortality of amputation will be further reduced. From Apr. 1, 1878, to Dec. 31, 1895, 938 major amputations were performed, and 80 patients died, a mortality of 8.5%. The mortality after amputations for injury was 13.1%, and for amputations for disease was 5.5%. [These results are admirable. MacCormac estimated the mortality in the London hospitals at 12.8%. Erdmann considered the results obtained in the hospitals of New York City, and estimated the mortality at 15.5%. Saline transfusion is of great benefit. In a condition where great shock is anticipated the tube should be inserted into

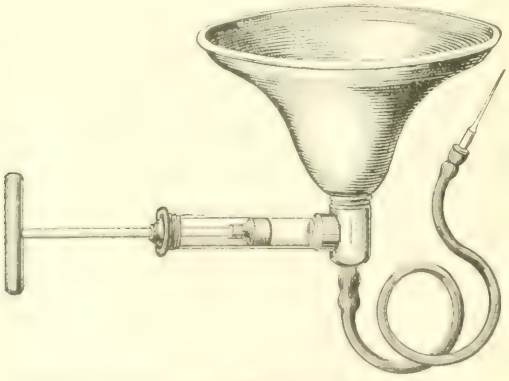


FIG. 8.—Collin's apparatus for the transfusion of blood.

the median basilic vein before beginning the amputation, so that the saline fluid can be introduced at a moment's notice. Great care is employed to allow no air to enter. Keen employs an apparatus (Fig. 8) which renders the entrance of air impossible.]

Wyeth[1] debates the question of **how to amputate.** He says the first question to bear in mind is the preservation of life; the second is the preservation of the greatest amount of usefulness with the portion of the part which is left. Since hemorrhage is the chief factor of shock, the prevention of blood loss is essential. When hemorrhage has not occurred before the surgeon takes charge of the case, this element of danger may be eliminated. When extensive bleeding has occurred before operation, the venous transfusion of a hot saline solution greatly limits the danger of shock and hemorrhage. Wyeth never follows any fixed rules as to how to amputate. He makes the flaps with the end in view of saving as much of the limb as possible. He usually considers the tarsus and the metatarsus as a single bone, pays no attention to joints, takes only the precaution of removing any thin film of bone or cartilage which might remain when the saw passed very close to one of the articulations. He makes one exception to this rule; that is, in amputating at or near the ankle-joint. He is convinced that a more useful member can be obtained by an artificial foot when applied to the stump of a Syme amputation than when applied to the stump of either a Pirogoff or Hancock amputation. From the ankle to the hip the same conservative idea prevails, unless the saw line would pass within an inch of the knee-joint or above the trochanters. In these conditions it is better to amputate at the joint. In amputating the attempt should be made to preserve as much of the extremity and as much of the tactile sense as possible. This is especially true in the case of those employing the hand in any vocation. In certain cases of those who do not labor it may be justifiable to secure a more shapely hand by the sacrifice of more of the members. In endeavoring to prevent blood loss in amputation it is not always necessary to force all the blood out of the extremity. When the patient possesses a normal amount of blood, and there has been no excessive hemorrhage and the general condition of the individual is good, the sudden forcing of a large amount of blood from the extremity into the general circulation may put a strain upon the heart that will produce a fatal result. Out of 7 hip-joint operations which Wyeth has performed by his method he has lost 1 case, and he is persuaded that this death resulted by strain on the heart-muscles due to forcing a large amount of blood into the remaining vessels of the body. Mere elevation of the extremity will cause most of the blood to gravitate into the vessels of the trunk. When a rubber tourniquet is applied to the thigh a wide rubber band should be used, and not a rubber tube, since the pressure of the tube may injure the nerve and may cause paralysis by inciting traumatic neuritis. Of course in amputations at the shoulder- or hip-joint this objection does not prevail, since pressure on the nerve has now become immaterial.

[1] N. Y. Med. Jour., Nov. 16, 1895.

Wyeth presents another point which is a great aid in effecting a rapid amputation. When making a hip-joint amputation or an amputation through large masses of muscular tissue, after tying large arteries and in order not to lose the time that would be spent if forceps were applied to oozing surfaces, pass deep catgut sutures through masses of muscle all the way across the whole cut surface and tie them firmly. Compression so applied prevents bleeding, and 10 or 15 minutes can be saved in an ordinary amputation. In amputating the hip-joint he now employs the tourniquet higher than he once advised. Complete control of the hemorrhage can be obtained by carrying the strong hard-rubber tubing close in the crotch, where it is held by the inner pin. The other pin is inserted so that the tube passes in the notch just below the anterior superior iliac spine. This mode of application brings the pressure above the level of the hip-joint, and the capsule can be opened to the bone, and the bone disarticulated with great rapidity. In some cases there will be found slight dripping from the posterior part of the flap when the bone is removed, but this is immaterial, and can be at once controlled by pressure with the fingers and the application of artery forceps. Amputation for malignant disease should be performed as far from the lesion as possible. [Many surgeons empty the limb of blood by the influence of gravity alone, and never employ the rubber bandage. Lister follows this method, and so does Senn. The suggestion that death may occur from forcing a great amount of blood from a large extremity into the remaining vessels of the body seems highly probable. The reason why it is not advisable to remove the head of the metacarpal bone after amputating a workingman's finger is because the necessary detachment of the transverse ligaments greatly weakens the hand. If a surgeon removes the metacarpal head, he secures shapeliness at the expense of power—a poor exchange which the modern world is rather prone to desire. The treatment of osteomyelitis demanding amputation, as set forth by Wyeth, we know to be efficient by repeated experiences. In Syme's amputation the elder Gross was accustomed to make an oblique incision, but he made it obliquely forward and not obliquely backward. Syme himself carried the incision *straight across* the sole of the foot, unless the heel was very prominent, when he carried it slightly backward. Joseph Bell's Manual of Surgical Operations contains an excellent description of the amputation devised by Syme.]

Samfirescou[1] presents **a new method of amputating at the elbow and the wrist.** A piece of bone is left in the flap, and he speaks of these procedures as osteoplastic amputations. He denominates the elbow operation the "osteoplastic brachioolecranon amputation." A posterior flap is made by drawing an incision from condyle to condyle, 2 fingers' breadths down upon the olecranon process. This incision reaches to the bone, and the soft parts with the periosteum are lifted up to the base of the olecranon. A saw is now taken and a transverse cut is made into, but not through, the bone (Fig. 9). An anterior flap is now cut similar to the posterior one (Fig. 10). The lateral

[1] Rev. de Chir., 1895, p. 839.

ligaments and the anterior ligaments of the joint are incised, the attachment of the triceps muscle is removed from the olecranon to the distance of $\frac{1}{3}$ in.,

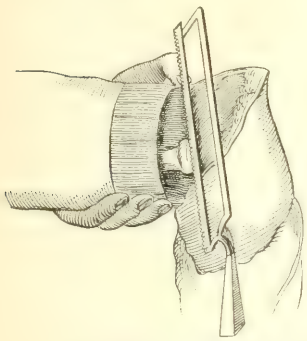


FIG. 9.—Formation and section of posterior flap, and transverse section of olecranon at its base (Samfirescou, in Rev. de Chir., 1895).

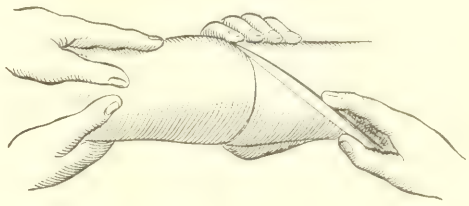


FIG. 10.—Formation and section of the anterior flap (Samfirescou, in Rev. de Chir., 1895).

and the olecranon is opened in the longitudinal direction until the transverse cut which was made at first is reached (Fig. 11). The forearm is now removed,

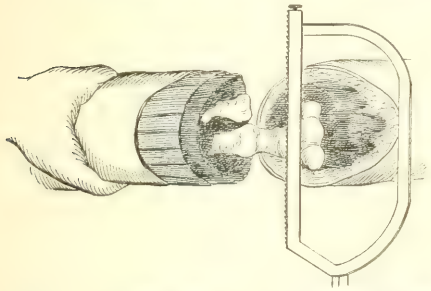


FIG. 11.—Vertical section of the olecranon at the point of junction with the transverse section (Samfirescou, in Rev. de Chir., 1895).

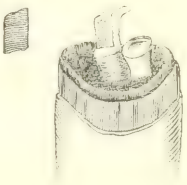


FIG. 12.—The forearm with the other half of the olecranon, the segment of the olecranon remaining in the external flap (Samfirescou, in Rev. de Chir., 1895).

and a piece of the olecranon process remains attached to the triceps tendon (Fig. 12). The end of the humerus is sawn (Fig. 13), and the remainder of the

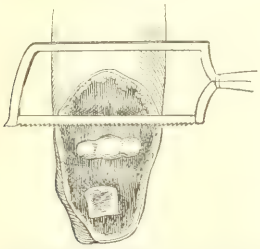


FIG. 13.—Transverse section of the bone of the arm, and a view of the segment of the olecranon in the posterior flap (Samfirescou, in Rev. de Chir., 1895).



FIG. 14.—View of the section of arm-bone and of the osteo-cutaneous flap (Samfirescou, in Rev. de Chir., 1895).

olecranon is brought against the sawn surface of the humerus and sutured to it (Figs. 14 and 15). The flaps are then closed. The operation at the wrist

he denominates the osteoplastic metacarporadio-cubital operation. He cuts a long external flap from the dorsum of the thumb (Fig. 16), which flap con-

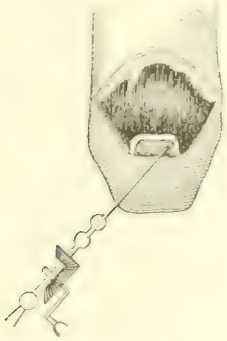


FIG. 15.—Osseous suture (Samfirescou, in Rev. de Chir., 1895).

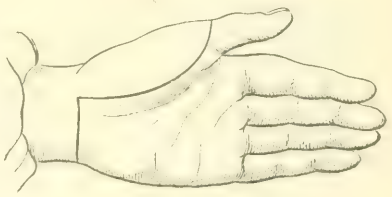


FIG. 16.—Outlining the flap with crayon (Samfirescou, in Rev. de Chir., 1895).

tains all the soft parts and also the metacarpal bone (Fig. 17); the remainder of the hand is removed by means of a transverse incision from the wrist-joint.

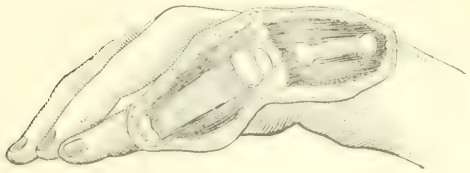


FIG. 17.—Section and turning back of the flap with the first metacarpal bone (Samfirescou, in Rev. de Chir., 1895).

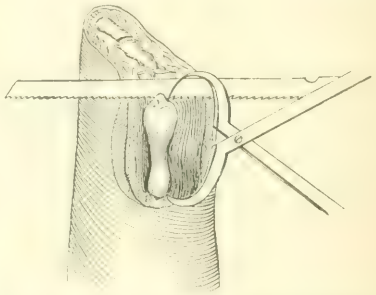


FIG. 18.—Vertical section of the metacarpal bone (Samfirescou, in Rev. de Chir., 1895).

Half of the metacarpal bone is removed by sawing it longitudinally (Fig. 18); the radius and ulna are then sawn off, and the remaining half of the meta-



FIG. 19.—View of the section of the bone of the forearm with the osteo-musculo-cutaneous flap turned back (Samfirescou, in Rev. de Chir., 1895).

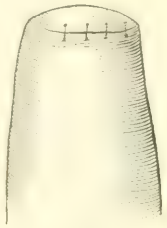


FIG. 20.—The stump (Samfirescou, in Rev. de Chir., 1895).

carpal bone is sutured to the radius and the ulna. The soft parts are then approximated (Figs. 19 and 20). [Samfirescou's amputation at the elbow seems to be upon the same principle as that of Symanowsky. Sabanejeff of

Odessa did a like operation at the knee. Kocher tells us that Sabanejeff sawed horizontally through the broadest part of the condyles and applied to the same surface a flap of bone removed from the anterior surface of the upper end of the tibia. Gritti cut the ligament of the patella, and directs that the articular surface of the patella be sawn off and applied to the sawn femur. (See Theodor Kocher's Text-Book of Operative Surgery.)]

McBurney[1] presents a record of a case in which he had performed **amputation of the forearm** by a new method for the cure of sarcoma of the radius. The ulna was free from the disease and the tumor had a firm capsule. A vertical incision was begun at the elbow joint, carried downward over the radius to the middle of the forearm, and then converted into a circular about the forearm. The flaps of muscle and skin were dissected up. The entire radius was excised; the ulna was sawn below the insertion of the pronator radii teres; the biceps tendon, which had been dissected from the radius, was sewn with catgut to the base of the coronoid process of the ulna. This last procedure was carried out in the hope that the power of flexion would be strengthened. The case resulted well. The patient made a good recovery, the disease has been sufficiently radically removed, the biceps seems to perform its function, the power of flexion is excellent, and the limb is very much more useful than if amputation at the elbow joint had been carried out.

Ritschl[2] records a case in which he did a double **amputation of the leg** with plastic formation of the foot by Bier's method. The patient made a good recovery, 3 months later was provided with boots like those used after Pirogoff's operation, and was able to walk about very well with the aid of a cane. This operation he considers has the advantages claimed for it by Bier —namely, 1. Atrophy from bone and muscle does not take place; 2. The patient has a steady gait, which can be improved by practice; 3. Freedom from ulcers about the head of the tibia; 4. There is no danger of a conical stump; 5. The expense of artificial legs is much greater than the expense of the shoes. [Bier advises amputation through the lower portion of the leg, the making of a cuneiform osteotomy upon the tibia above the stump, the bending forward of the stump with the lower fragment of bone to a right angle with the upper fragment. The two fragments unite and form a foot. (See Kocher's Op. Surg.)]

Rioblanc[3] shows the records of 85 cases of **Gritti's amputation.**. They show a mortality of 19%, but not one of these deaths depends in any way upon the mode of operation which was selected. In 69 cases the patella was displaced 7 times, and in 2 of these it was readily restored to position. Suppuration was the usual cause of displacement of the patella. In all cases in which it was possible to watch the patient for a considerable time it was found that the stump stood pressure excellently, and the rule was followed to allow the artificial limb to press directly upon it. He advises the following points as important to remember: 1. Saw the femur 6 or 7 cm. above the articula-

[1] Ann. of Surg., Feb., 1896.

[2] Beiträge z. klin. Chir., Bd. xiii. Ht.

[3] Lyon méd., Apr. 21, 1895.

tion. This enables us to easily turn the patella under without cutting the quadriceps. 2. Suture the patella with silk or catgut. 3. Do not use needles or wire. These latter agents might produce rarefying osteitis. Absolutely immobilize the stump and hip-joint for 6 weeks, in order to get solid bony union. 4. Rigid asepsis. [Disarticulation at the knee-joint was preferable, in former times, to amputation through the condyles of the femur, but since the advent of aseptic methods it is not so necessary to amputate as low as possible. An objection to Gritti's amputation has always been found in the trouble the surgeon meets with in turning the patella under. Rioblanc claims to do away with this objection by sawing the femur 6 or 7 cm. above the articulation. He can then turn the patella under without cutting the quadriceps. Gritti's amputation has never become very popular, although it has been before the profession for almost 40 years. It was introduced by Gritti of Milan in 1857. It is difficult to saw the patella, and it is hard to keep it in its new position. Nevertheless, the flap bears pressure well, and the operation, though not as valuable as disarticulation through the knee-joint, is probably better than amputation through the femur above the condyles. Treves gives a very judicious estimate of these condylar operations, and prefers Carden's as the best.[1] Stokes has maintained that in Gritti's operation the patella will not fit in its new position: the sawn surface of the femur is too large, and the patella projects forward or is drawn up in front of the femur. Stokes gets a surface to which the patella adjusts itself by sawing the femur ½ in. *above* the condyles. Lister praises Carden's amputation. Jacobson[2] thinks Carden's amputation a very valuable method.]

Buechner[3] advises that in many cases **amputation at the knee-joint** should be done by the method of Sabanejeff of Odessa. He considers that the stump formed by this operation is as round as the normal knee, and bears the weight of the body without discomfort. The normal relation of the parts is but little disturbed, and the weight is thrown upon a part which is accustomed to bear it and which is arranged for that purpose. It will be recalled that when we kneel the weight does not rest upon the skin covering the patella, but upon that over the tuberosity of the tibia, and this operation enables the sufferer to have the weight upon the proper point. He alludes to Koch's 5 cases operated upon at Dorpat with invariably good results. Buechner gives an excellent description of Sabanejeff's amputation, and says he has employed it in 1 case and is delighted with it.

Miller[4] maintains that **the circular method of amputation** is the one **best adapted to disarticulation at the knee and elbow.** A circular incision is made below the condyles, 1½ in. below them in the arm, 2½ in. below them in the leg. This incision reaches to the deep fascia. The unequal retraction of the skin on the flexor aspect of the limbs makes the line of incision oblique. Two incisions are now made immediately below the condyles and the original cut. This permits the flexor flap to retract still more,

[1] Treves's Manual of Operative Surgery.
[2] Surgical Operations, by W. H. A. Jacobson.
[3] Jour. Am. Med. Assoc., Mar. 21, 1896.
[4] Edinb. Med. Jour., July, 1895.

and a few touches of the knife will cause it to almost entirely disappear. The extensor flap is now dissected up to above the olecranon in the arm and above the head of the tibia in the leg. Disarticulation is performed in front in either extremity. It is well to save the patella when we amputate at the knee. This method gives us a long flap from the extensor surface of the limb, with practically no flap on the flexor surface. It gives a very useful and shapely stump. This method, he maintains, has the acknowledged advantages of a single skin flap, and disarticulation can be very easily and quickly performed. It presents no intricate details. The flap is already accustomed to pressure, but a small amount of tissue is demanded, and the cicatrix is placed in a very advantageous position. [The oblique incision of Kocher possesses all of the advantages of Miller's operation, and is certain to secure an ample flap.]

Ochsner[1] presents a second case in which he operated for enchondrosarcoma by the **removal of the entire upper extremity.** In operating he followed chiefly the rules laid down by Berger. He made an incision over the clavicle, lifted up the periosteum, cut the clavicle with bone forceps, elevated the outer portion, lifted the posterior layer of the periosteum along with the subclavian muscle, and was able to see plainly the vein at the point in front of the middle scalene muscle. The branchial plexus was separated by blunt dissection. The catgut ligature was passed around the artery and vein, and silkworm-gut ligature was passed around the vessels $\frac{1}{4}$ in. above the catgut ligature; both ligatures were carefully tied, forceps were applied to the vessels 1 in. below the ligatures, and the vessels were cut between the forceps and the ligatures. The flaps were formed by Berger's method. There was almost no blood lost during the operation. The author has noticed in a considerable number of amputations near the shoulder and hip that a patient shows little evidence of shock when large nerves are severed with a sharp knife, but shows severe shock when they are cut with scissors. In his former case he ligated the vessels with silk, and as a consequence a sinus formed several months after. In this case he used catgut and applied a second ligature of silkworm gut, which was left long so it could be withdrawn in case the vessel necrosed below the ligature; as this condition did not occur, the silkworm ligature was cut through after the wound was entirely healed. He maintains that it is wise to apply the first ligature around both artery and vein, including sufficient surrounding tissue to avoid the danger of wounding the vein. He does not approve of ligaturing the vessels separately. He believes that this operation is indicated in cases in which sarcoma involves the tissues overlying the shoulder joint, the clavicle, the scapula, or the upper end of the humerus. Because of the well-known tendency of sarcoma of any portion of the humerus to recur, he considers this operation to be proper even when sarcoma affects the lower portion of the bone.

G. C. Hall[2] has reported a successful case of removal of the entire upper extremity. He began by making a posterior flap, and secured the vessels as

[1] Ann. of Surg., Dec., 1895.

[2] Lancet, Feb. 8, 1896.

he advanced. He then attacked the part and tied the subclavian artery. The patient made a rapid recovery.]

Charlot[1] advises a method of **hip-joint amputation** by means of which he claims that the danger of hemorrhage can be entirely obviated. He makes a very small incision through the abdominal muscles just internal to the anterior superior iliac spine. He strips up the peritoneum and tissues internally, and passes a finger as far as the angle which the psoas muscle forms with the promontory of the sacrum. There he finds and compresses the termination of the common iliac artery. Of course the upper end of the femoral vein may bleed from reflux, even when the common iliac vein is compressed at the same time as the artery. He carried out this plan in 1 case and found it very easy. [Wyeth's pins are easily used, are secure, permit of firm compression, and never get tired. Finger-pressure is not secure, and is liable to relaxation from tire or from accidental movements. We can see no reason why the pins should not be employed.]

F. Tilden Brown presents, in the Annals of Surgery, a method of **hip-joint amputation** whose special feature consists in controlling hemorrhage **by means of a large-sized clamp.** He makes an anterior incision like that Barker makes for resecting the hip. It is carried down vertically upon the thigh, and a circular incision is made at the lower end of the vertical incision. A clamp is passed in to the vertical cut in such a way as to grasp, without especially compressing, the sartorius muscle, and the ends of the clamp compress the femoral artery and vein (Figs. 21 and 22). Brown claims that this method may be used upon all cases, but is especially valuable

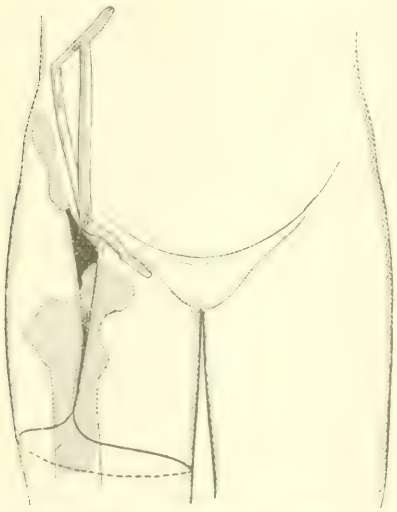


FIG. 21.—To show the anteroexternal incision with its relation to the upper extremity of the femur and to the femoral clamp (F. Tilden Brown, in Ann. of Surg.).

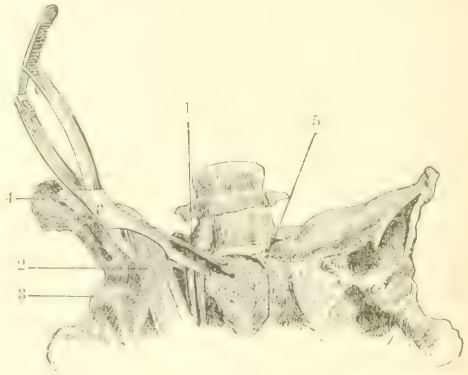


FIG. 22.—Showing application of clamp to the femoral vessels: 1. Poupart's ligament, femoral vessels below it grasped by the clamp. 2. Sartorius straddled and retracted by the clamp. 3. Hip-joint well exposed by inward retraction of sartorius. 4. Origin of sartorius at the anterior superior spinous process. 5. Symphysis (F. Tilden Brown, in Ann. of Surg.).

where the operation was begun as an exploratory incision, incision disclosing

[1] Ann. of Surg., Sept., 1895.

the fact that amputation is necessary. Brown says if he were deprived of the services of the clamps he would use digital compression of the femoral vessels immediately below Poupart's ligament, the fore finger being passed through the upper angle of the incision and under the sartorius muscle to beneath the common sheath of the artery and vein. [The clamp is more troublesome than the pins. The operation must be prolonged, and all other vessels except the femoral will bleed. The anterior incision can be made if the pins are applied high up.]

Paul [1] reports 7 cases of **hip-joint amputation** without a single death. Since hip-joint amputation can be performed with as great rapidity as any other major operation, and as it involves but little more tissue, he thinks the usual high mortality is due to hemorrhage. He fixes Esmarch's band by a bandage passed over the shoulder and around the opposite hip. He cuts a large anterior flap, disarticulates, and cuts through the posterior flap from the wound outward. As soon as the anterior flap is cut the femoral artery is tied. The strips of bandage which hold the tourniquet are 2 in number, 1 in front and 1 behind, and they are carried around the pelvis above the crest of the ilium in front and the tuberosity of the ischium behind; then the ends of the bandage are taken back to the shoulder and hip and tied tightly. As this maneuver takes off some of the compression of the band upon the iliac artery, a roller bandage ought to be pushed under this tourniquet at this spot to increase pressure on the artery.

In a note the author also tells of an 8th case which was also successful. [These statistics are most gratifying. This mode of arresting hemorrhage is valuable in an emergency, but is not as secure as the method of Wyeth. The fact that lifting the band toward the body "takes off some of the pressure" constitutes an objection to the plan.]

ANESTHESIA AND ANESTHETICS.

Scofone and Battistini [2] have made experiments with **formanilid** and **antipyrin** as anesthetics. They conclude that formanilid in solution of a strength of 2% and antipyrin in a solution of 30 to 50% can produce local anesthesia when applied to the mucous membranes, to skin from which the epidermis has been removed, to the trunks of nerves, to muscles, and to the brain. Washing off the part with a normal salt solution quickly arrests the anesthesia. Formanilid is not altogether safe, as it may produce poisonous symptoms. [The anilids are "substituted anilins with acid groups in side chain" (Sadtler and Trimble). They can be made by treating anilins with acid chlorids or acid anhydrids. Formanilid is made by rapidly distilling anilin with oxalic acid. It appears as colorless crystals soluble in water or alcohol. Acetanilid belongs to the same group as formanilid. Antipyrin in solution of only 10% has more anesthetic effect upon mucous surfaces.]

Lucas Championnière [3] has made extended trial of **guaiacol** as a local

[1] Liverpool Med.-Chir. Jour., No. 29, 1895. [2] Wien. med. Presse, 1895, xxxvi. p. 1338.
[3] Bull. de l'Acad. de Méd., July 30, 1895.

anesthetic. This drug was first applied to relieve pain by Andre, a Parisian pharmacist, who applied it to a burn on his own person. The results of this were most gratifying. The drug was then tried hypodermically. Sterilized solutions of guaiacol and oil of sweet almonds were used, but guaiacol was subsequently found to be a better menstruum than the oil of sweet almonds. Solutions of the strength of 10% and 5% are used in the 1% solutions; 10 cgm. of guaiacol are injected, and in the 5% solution 5 cgm. This method was tried in extracting teeth and was found to be entirely successful. Lucas Championnière has used it in many minor surgical operations. He tells us that it is as powerful as cocain, and is free from the dangerous effects of cocain. After administering the injection the surgeon should wait from 5 to 8 minutes for the drug to completely take effect. [That guaiacol is said to be safer than cocain is worthy of attention, as the latter agent frequently produces alarming symptoms and has caused not a few deaths—more, probably, than have been reported. Bazy urges dentists to try guaiacol, as the dental use of cocain is especially dangerous, because the patient is not recumbent. The same observer says that guaiacol is superior to cocain in the fact that it fully anesthetizes muscular areas. Pine has stated that pain under the skin can be relieved by applying compresses wet with from 15 min. to 5j of guaiacol and bandaging them firmly in place. Guaiacol applied in this manner produces anesthesia of the skin to such a degree as to permit of the performance of slight operations. Large amounts of the drug or an impure article must not be used, he says; neither must the application be prolonged, because of the danger of collapse. Ferraud says that 1 c.c. should be the amount applied externally—that this amount allays the pain of intercostal neuralgia and phthisis; it may produce abnormal temperature, but is not dangerous. Laborde, Gilbert, and Degan have testified to the anesthetic effects of the drug. The agent is a powerful vaso-constrictor, and Championnière has seen local gangrene follow its use.]

Schleich[1] has presented a new local anesthetic which he calls **eucain.** It is claimed to be as efficient as cocain, and to be free from the dangerous qualities of the latter. The salt used is the hydrochlorate, which is soluble in water and does not decompose when boiled with water. The solution does not subsequently form a precipitate, and it is not necessary to add phenol or salicylic acid to preserve it. This agent is efficient when painted on mucous membranes or when injected into the area to be operated on. It produces a more extensive area of anesthesia than does cocain, and the anesthesia lasts longer. [Trial has been made of eucain in the out-patient surgical department of Jefferson Hospital, and the results have been most satisfactory. In the removal of ingrown toe-nails we have a procedure which brings a local anesthetic to the test, and in these usually painful operations eucain has proved more satisfactory than cocain, the anesthesia from eucain being more profound and prolonged and widespread than is that from cocain. (See Dr. Geo. W. Spencer's report in the Univ. Med. Mag., Nov., 1896.)]

[1] Am. Med.-Surg. Bull., June 6, 1896.

Andre Lapointe[1] maintains that we should never induce **cocain-anesthesia** without strictly observing the following rules, as the safety of the patient demands this care: The solution should be always fresh, not of a greater strength than 1% ; a sterilized syringe which holds 15 ♏ is employed to make the injections. The patient should invariably be in the recumbent position, and the surgeon should not wait longer than 5 minutes after injection before beginning operation. More than $2\frac{1}{2}$ gr. of the drug should never be administered. Cases of poisoning, cerebral anemia, and syncope are apt to arise, due to the constricting action of the cocain on the bloodvessels. [In many more cases than is usually assumed some degree of toxic influence is manifested after the use of cocain. The slighter symptoms are dry mouth, repeated attempts at swallowing, dilated pupils, cold extremities, high-tension pulse, which is usually slow, restless tossing, tremor, and talkativeness, followed by a sleepless night and the passage of large amounts of pale urine. The graver symptoms are better known—delirium, syncope, convulsions. Death may be due to paralysis or to fixation of the respiratory muscles (Mosso). The drug is often dangerous, always uncertain, and many people have an idiosyncrasy toward it. Reclus said over a year ago that 14 deaths from it were upon record. Not more than gr. $\frac{1}{3}$ should be used hypodermatically.]

Weller Van Hook[2] strongly maintains the value of **infiltration-anesthesia** by the method of Schleich. Schleich found that by combining a small quantity of cocain with a weak salt solution there was no discomfort in the injection, and prolonged anesthesia was produced, and that the addition of a little morphin to the solution prolonged the anesthetic action to a greater degree. Anesthesia which follows such an injection is due to artificial ischemia, the pressure to which the tissues are subjected, the lowered temperature brought about by the cool injection, and finally to the direct action of the contained drugs. As local anesthesia can be induced in a very few minutes with the use of a solution of 1 part of cocain in 1000 of water, this method certainly presents great advantages. The materials required consist of a good ordinary hypodermic syringe and the following solution: $1\frac{1}{2}$ gr. of cocain hydrochlorate, $\frac{1}{3}$ gr. of morphin hydrochlorate, and 3 gr. of common salt, which are dissolved in 3 oz. and 3 drams of sterilized water. The surgeon can carry with him in his minor operating case a number of such powders, so that his solution is always fresh. If the solution is several days old, 2 drops of 5% phenol should be added to it before using. Two other solutions are recommended—one containing double the quantity, the other containing $\frac{1}{10}$ the quantity, of cocain of the first solution. The very strong solution is used for inflammatory lesions, the weak solution for prolonged operations. For most cases the medium solution is the best.

Van Hook insists that the value of these materials lies almost entirely in their application. The hypodermic syringe is used to fill the tissues to distention with the fluid. The needle is introduced into the skin at the desired

[1] La Presse méd., 1895, No. 35.

[2] Med. News, Nov. 16, 1895.

point, the syringe being held almost parallel with the skin. The point of the syringe must not be pushed through the skin, but must stop within the skin,

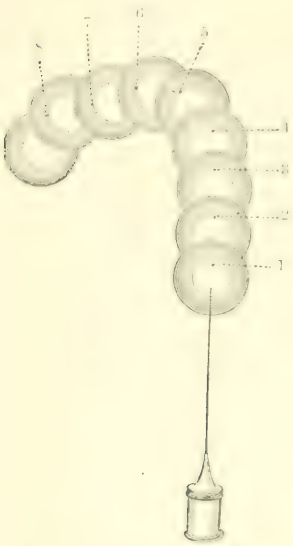


FIG. 23.—Showing how the successive wheals are raised, the point of the syringe being inserted at the points marked by the dots (after Schleich, Med. News, Nov. 16, 1895).

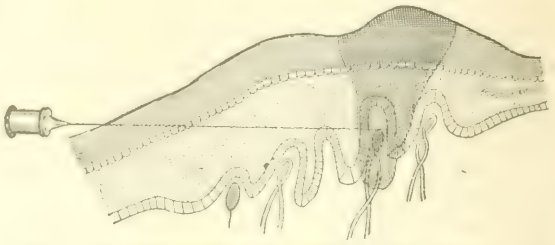


FIG. 24.—The syringe-point stops at the papillary layer, and the fluid lodges in the skin itself (Schleich, Med. News, Nov. 16, 1895).

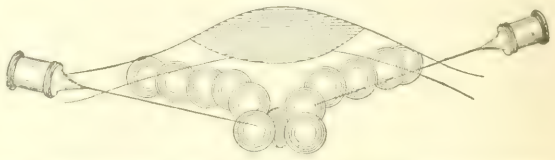


FIG. 25.—Showing mode of injecting the fluid under an abscess (Schleich, Med. News, Nov. 16, 1895).

so that the fluid will distend the skin, thus raising a white wheal somewhat like a mosquito bite (Figs. 23–25).

Schleich himself freezes the skin at the site of the first puncture with the spray, ethyl-chlorid. When the area is infiltrated it becomes instantly anesthetic. The surgeon must be sure the area he wishes to operate upon is thoroughly infiltrated, and when pain is produced in operation it is because the surgeon has not infiltrated thoroughly. When the first small area has been anesthetized it only remains to infiltrate a sufficient number of new circles adjoining the first to include the field of operation, and as the first area is devoid of sensibility the adjacent skin can be infiltrated by painlessly inserting the needle into the edge of the wheal and forcing the fluid into the tissues met at this point.

Having anesthetized the skin area at this point, the subcutaneous tissue is infiltrated by passing the needle through the skin. The fascia, muscles, and periosteum can be anesthetized in the same way. All these procedures may be carried out aseptically. The anesthetic influence lasts about 20 minutes. If the operation is longer than this, the infiltration can be repeated.

We should remember that inflamed tissues are hypersensitive, and must not themselves be infiltrated until the neighboring tissues have been anesthetized. For instance, we should never inject the fluid into the apex of a furuncle without first anesthetizing the skin around it. When working on the skin and mucous membrane the surgeon should use fine and sharp needles.

If it is necessary to sever large nerve trunks, inject first a drop or two of 5% phenol into the sheath of the nerve. In amputating fingers begin the infiltration over two points on opposite sides of the member and continue it along the line of proposed incision, and infiltrate the deeper tissues, including the periosteum, with great care. The most serious case on which Van Hook has operated by this method was a varicocele. Schleich has performed celiotomy under infiltration-anesthesia, removing ovaries, tubes, etc. Van Hook holds that we should use this method in opening an appendicular abscess when the abscess is adherent to the abdominal walls and requires simple drainage. Local anesthesia is especially desirable in opening and draining empyema cavities, since when the thoracic viscera are compressed even ether is very dangerous.

The recent advances in the methods of **local anesthesia** is the title of a paper by Lund[1] of the Boston City Hospital. He clearly and carefully reviews the recent progress which has been made, and describes especially the **infiltration-method of Schleich.** He insists upon the necessity for a careful technic, and maintains that the anesthetic effects of the fluid are greatly enhanced by keeping the bottle on ice before operation. He tells us that to Schleich is due the credit of demonstrating that the intracutaneous injection of various drugs, and not cocain alone, in very dilute solution produces local anesthesia, the effect not depending solely upon the drug itself, but being due to the pressure of the infiltrating fluid upon the nerve filaments, the arterial anemia, and the comparatively low temperature of the fluid. These facts enable us to dispense with cocain except in proportions so small as to relieve us of any apprehensions of danger. The injections are begun endermically, and not hypodermically, in the healthy skin surrounding the inflamed area, and the latter is advanced upon carefully and is gradually and thoroughly infiltrated. The area of infiltration must not only go around, but must get beneath, the inflamed tissues, so as to completely encompass them with an area of artificial edema. In infiltrating the wall of an abscess remember that injections into the abscess-cavity will do no good. If there is no outlet, they add to the pain by increasing tension. If there is an outlet, they run out without infiltrating the tissues. Injections into the sacs of cysts or the tissues of tumors are barren of all results. Every tissue of the body is rendered anesthetic when infiltrated in the manner described, and we can even anesthetize bone by infiltrating the periosteum or by injecting the medulla. Nerve-trunks are anesthetized first by touching the spot with a drop of pure phenol, and through this making the injections in the same manner that we anesthetize mucous membranes. When operating under the influence of this method there will be very little bleeding, because the distention of the tissues compresses the small bloodvessels. If it becomes necessary to grasp a divided artery with forceps, touch it first with a little pure phenol, in order to anesthetize the nerve which accompanies it. Lund does not think that the method is suitable to extensive operations in inflamed and brawny

[1] Boston M. and S. Jour., Feb. 6, 1896.

tissues, owing to the mechanic difficulty of thoroughly and painlessly infiltrating all the inflamed area. This is especially true when the inflamed tissues are brawny or are richly interwoven with fascial fibers. Abscesses of the palm of the hand and sole of the foot in laboring men are not suited to this method, although it is quite true that a soft and pliable palm can be infiltrated with success. The method is very successful when applied to loose and spongy tissues, even if they are much inflamed. Felons can be opened and curetted, sequestra removed, and amputations performed with absolute freedom from pain. In the performance of more extensive operations the surgeon must be ready to lay down the knife and take up the syringe on the slightest expression of pain by the patient. In some very nervous patients the method is difficult to apply, and such people will do better under ether. The general verdict will be against Schleich's method in major operations. It is not wise to complicate difficult operations by constantly stopping to reinfiltrate the operative field, and it is not always desirable to have the patient witness the efforts of the surgeon even though they be painless. In cases, however, where the condition of the heart, shock, or the danger from vomiting (for example, in strangulated hernia) render ether dangerous, the infiltration-method is of immense advantage. There is no reason why such operations as kelotomy for strangulated hernia, tracheotomy, resection of a rib for empyema cannot be performed under infiltration-anesthesia. The advantage of general anesthesia in long and complicated operations, even in short operations where muscular relaxation is desired—for instance, the reduction of dislocations or deformities due to fracture—are so great that we do not think it will ever be displaced by the infiltration-method.

J. Jackson Clarke[1] makes some observations upon **cocain-anesthesia,** which he strongly approves of in minor surgery. He thinks the more serious operations are unsuited for cocain-anesthesia, because unexpected complications may arise and demand very radical measures, but in emergency cases cocain may be used, especially in tracheotomy Whenever we can apply an elastic band we can use cocain with far more safety than in regions where this cannot be done. He has observed in 1 instance deafness and nausea follow the hypodermic injection of $\frac{1}{10}$ gr. Old people are especially susceptible to cocain, and whenever it is used amyl-nitrite and brandy ought to be readily accessible. In heart-disease the drug is not safe. Most fatal accidents have been due to the application of cocain to mucous surfaces. It is undoubted that many cases attributed to special idiosyncrasy have arisen because the drug was thrown directly into the veins or because an inordinate dose was administered. For a number of years Clarke has been using a 1% solution for hypodermic injections and a 2% solution for mucous surfaces, but of late he has accepted the Schleich method. He then discusses the Schleich method, and agrees in the main with what we have previously stated. He tells us there is a limit to the amount of infiltration which is desirable, for if the wheal is extremely tense the parts will remain red and tender for 24 hours after the injection. He does

[1] Lancet, Jan. 18, 1896.

not think that we possess a perfect syringe. [Bransford Lewis has modified the needles and devised a syringe for infiltration. With ordinary needles there is always danger when injecting the deeper structures, that of puncturing some large vessel. This is to be especially apprehended in the enucleation of glands from over the femoral vessels.]

Lewis's needles are shown in the cut (Fig. 26). They are blunt and are

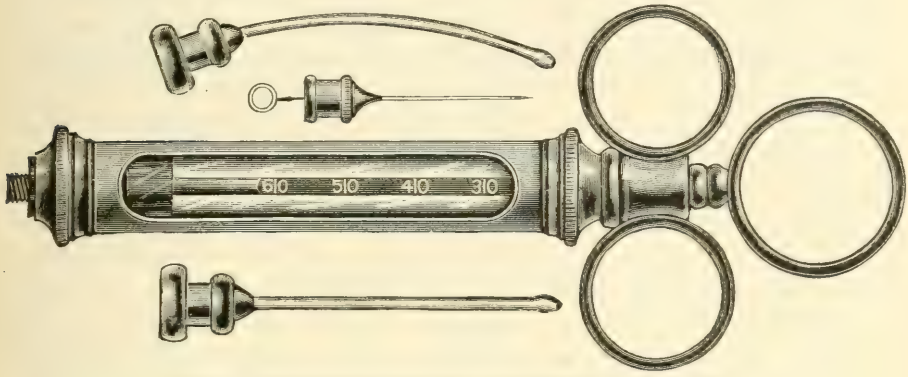


FIG. 26.—Lewis's needles and syringe for infiltration-anesthesia.

made of German silver. They are strong enough to be pushed into connective tissue after the skin has been cut, but are not strong enough to be pushed into a vessel, as they will bend rather than penetrate. Anesthesia is begun in the superficial parts by the use of sharp needles of steel, and is continued in the deeper parts by the use of blunt needles of German silver. (See Va. Med. Monthly, Feb., 1896.)

[For generations surgeons have sought to secure local anesthesia. It was known centuries ago that the local application of carbon dioxid had some power to allay pain, and the celebrated Memphis stone was esteemed because it furnished a ready means of generating this gas. The yeast poultice of our fathers was a local sedative because of its power to give off CO_2. Near the end of the last century Moore tried compression, endeavoring to make pressure upon the nerve trunks and thus produce anesthesia in nerve trajectories, but the method was itself painful, was unsatisfactory, and was not free from danger. James Arnott invented the process of freezing by ice and salt (2 parts to 1 part); B. W. Richardson substituted the ether spray for ice and salt; and Bigelow of Boston commended the use of rhigolene. Freezing has never been satisfactory except in trivial operations. We freeze a larger area than we need to cut. The freezing alters the appearance of the tissues and thus makes exact recognition difficult; it hardens the tissues and renders cutting slow and uncertain; it is only suited to superficial parts; pain is felt during the processes of freezing and thawing, and severe inflammation, even sloughing, may arise in the damaged area. Freezing, however, has a distinct field of usefulness: it is of value when we wish to make superficial incisions or punctures, and is of great use to prevent the pain of the needle puncture in injecting

Schleich's fluid. Ethyl-chlorid is the best agent with which to freeze tissue. It comes in glass tubes which are drawn out to a point; each point is perforated, and is covered with a brass screw-cap. When the cap is removed the ethyl comes through the fine opening when the bulb is held in a horizontal position, and furnishes a spray, and the flow of the spray can be hastened by holding the bulb in the warm palm. In order to freeze a part the tube should be held 9 or 10 in. from the skin. The skin is first reddened, but as it freezes suddenly turns white, and when the skin has whitened the area will remain anesthetic for 10 minutes or more. These tubes of ethyl-chlorid were devised by Bengué of Paris. Schleich was impressed with the unsatisfactory nature of attempts to secure local anesthesia, even cocain having failed to realize expectations, besides being sometimes dangerous. He found that cocain sometimes was satisfactory, but sometimes failed utterly, the failure being due to the fact that the fluid was not widely enough diffused to anesthetize the anastomosing fibers. Leibreich showed us long ago that the injection of water would irritate nerve filaments, and by abolishing their function would produce anesthesia, but this area of anesthesia was itself painful (anesthesia dolorosa). Schleich found that injections of normal salt-solution produced no pain and obtained no anesthesia, because it produced no nerve irritation. He further showed that a $\frac{2}{10}\%$ salt solution produced no pain and obtained anesthesia in normal parts, though not well in inflamed parts. The anesthesia produced by salt solution is due to pressure, to edema, and to slight irritation of nerves, but to obtain it the area must be distended or infiltrated. He found that small quantities of morphin, carbolic acid, and cocain, when added to the fluid, intensified and prolonged the anesthesia and enabled us to obtain it even in inflamed tissues. This is because the large amount of solution brings the cocain and morphin and phenol into intimate contact with nerve filaments over a wide area. The cocain and morphin are present in such small quantities as to cause not even the slightest danger. Schleich's method is not suited to long operations, as the surgeon might be forced to repeat the injections again and again. It is not suited to operations of great danger, as even the bravest patient might move or tremble, and it is not fit that even the bravest should be made to contemplate his danger. It cannot be used when muscular relaxation is sought for. It can be used in a great number of operations, and is an agent of the highest value. Dr. Keen has performed Bassini's and Maydl's operations and tracheotomy with perfect ease under Schleich's anesthesia. Under the same process Schleich has done celiotomy. Tracheotomy and kelotomy can with advantage be done under local anesthesia; so can rib resection, opening of abscesses, amputation of fingers and toes, the removal of many small tumors, and some plastic operations.]

Wurdemann discusses the **infiltration-method.**[1] After setting forth the essential points he cautions us to remember that the use of attenuated solutions of narcotic drugs has nothing akin to homeopathy. Cocain-injections in strengths of 5 to 10% solutions are very much more dangerous to life than

[1] Jour. Am. Med. Assoc., Nov. 16, 1895.

is the inhalation of chloroform. The higher strengths of cocain retard the healing process, and in some cases destroy the trophic nerves and produce gangrene. Schleich's method never causes anything of the sort. The anesthesia from it is very complete and is immediate. We might safely operate by this method for 2 hours if so inclined, repeating the injections whenever pain became manifest.

Freeman of Bristol is a strong believer in the slow and gradual anesthesia. He employs **the Clover inhaler.** He states that in using this inhaler the common custom is to rotate the ether reservoir until the indicator shows full-on, then to get the patient under, and then to let the indicator down to the figure 2 for the rest of the operation. He used to employ this method, but now he finds it easy in 90% of cases to obtain satisfactory anesthesia by rotating the reservoir to the figure 2 until the patient is gotten under ether, and then maintaining the anesthesia with the indicator midway between 1 and 0. This gives the patient less ether and maintains complete anesthesia. There are not the same dangerous reflex symptoms in incomplete ether-anesthesia as in incomplete chloroform-anesthesia, and yet even incomplete ether is more dangerous than complete anesthesia. Occasionally strong muscular men, especially alcoholics, will require more ether than we have indicated. As soon as the breathing becomes stertorous another breath of fresh air should be given—not many breaths, for if we allow this the patient would begin to come to. When complete narcosis has been induced the anesthetist permits sufficient air to enter to prevent cyanosis, and limits the entry sufficiently to prevent the patient coming out of the anesthesia. The longer the patient is under the anesthetic the greater the amount of air we can administer. The quantity of fresh air that should be given after the patient has been under the anesthetic for an hour would be incompatible with good anesthesia in the early stage of the administration. One breath in 8 or 10 inhalations can be permitted after the first 20 minutes, and after that 1 in every 5 or 6. So long as there is no cyanosis, we know that the patient is getting sufficient air, and by using a less concentrated vapor of ether there is less tendency to duskiness than when a strong one is given. It is always better to give ether slowly at the beginning, because by this means the patient's mind becomes dazed before the vapor is sufficiently strong to cause discomfort. When we commence with strong vapor, spasm of the glottis is usual, and this produces a fearful sense of impending suffocation. By this slow method of administration there is less secretion of saliva and mucus, and this is another reason why there is less cyanosis. The air-passages are not much irritated, and accumulation of mucus in the trachea is not likely to take place. The pupil, too, is a smaller one. The after-discomfort is less, the patient comes around quickly, there is less vomiting, and the taste and smell of ether soon pass off, and after-affections of the air-passages are unusual. When administered in this manner ether can be given with perfect safety to children and elderly people. [We have always believed strongly in the slow administration of ether. It is safer; it is more comfortable; it is surgical; it gradually brings about a

change in the blood and tissues, which if brought about suddenly must be dangerous; and anesthesia can usually be obtained without struggling. The rapid administration produces cough, a horrible sense of impending suffocation, fear of death on the patient's part, vomiting, struggling, cyanosis. We know of few spectacles more barbarous than that of a patient being enthusiastically anesthetized by a novice, when ounces of ether are poured upon an inhaler, and a corps of combative and irritable assistants fight and struggle with some unfortunate who believes he is fighting for his life. We have never been persuaded that any of the more complicated inhalers is equal to the device of Allis in safety or simplicity.]

Ziegler,[1] who has recently taken to the administration of **ether,** holds that many of the usually recorded unpleasant effects can be entirely obviated by care and experience in the administration; furthermore, that ether is less dangerous than **chloroform** because cardiac failure, though it may occur, is secondary to respiratory failure, which latter condition gives fair warning and can be successfully overcome. He thinks ether is not advisable in face operations, and is contraindicated in diseases of the air-passages. He says that the latest statistics show that 1 death occurs in 1900 administrations of chloroform, and 1 death in 26,000 cases of administration of ether. [Chloroform is undoubtedly administered with more ease in face operations, but ether can be given if desired. Souchon's apparatus (*Year-Book*, 1896, p. 332) enables us to give ether readily without being in the way of the operator. In operations about the face and mouth many surgeons first anesthetize with ether, and substitute chloroform when the operation begins. Chloroform is given more easily in such cases, because a large admixture of air is beneficial rather than harmful, and the anesthetizer does not employ a bulky towel or inhaler, but simply cotton wrapped in a piece of gauze grasped by a pair of ring-forceps. In regard to the relative death-rate between ether and chloroform, Chaput maintains that chloroform kills 1 in 2000, ether 1 in 13,000. This distinguished surgeon prefers ether for other reasons as well. It is quicker than chloroform, anesthesia being complete in from 4 to 6 minutes; it strengthens the heart; it produces less injury to the kidneys; it rarely causes vomiting; patients revive more quickly; it can be given by a comparatively unskilled anesthetizer, while chloroform can be entrusted only to a skilful man. Poncet has used ether in from 23,000 to 25,000 cases, and has had 1 death. He thinks that the danger of ether is suffocation, and this can often be successfully combated by artificial respiration or tracheotomy (he has performed tracheotomy with success 4 times). He does not use ether in the very old or very young (danger of bronchial catarrh), at night (danger of fire), or about the face; and he never gives morphin and atropin before administering ether, as he considers mixed anesthesia dangerous. We think the danger of using ether at night has been much exaggerated. We use it frequently at night, and simply take the precaution to have ventilation and to see that any light is placed high up and not below the level of the patient's head. In regard to

[1] Münch. med. Woch., No. 23, 1895.

ether being less apt to cause vomiting, we must disagree. Championnière is right when he declares that ether frequently produces after-vomiting, after-excitement, and thirst. (See abstracts by Wilson in Am. Jour. Med. Sci., Feb., 1896.) Chloroform is pleasanter, ether is safer in general. In some particular cases chloroform is safer than ether. It is safer in the aged and very young.]

Gurriere[1] has been repeating the experiments of Dolbeau with the purpose of determining whether **chloroform** could be successfully **administered during sleep** without wakening the sleeper. Dolbeau conducted his experiments on individuals affected with bodily disease. Gurriere performed his upon individuals free from bodily disease who were convalescent from mental troubles at the time of administration. The administration of chloroform was begun very slowly, a handkerchief containing it being held 3 in. from the nostrils and gradually taken nearer to them. If the patient made attempts to wipe away the cloth with the hand, or if any other reflex motions were noticed, the administration was temporarily suspended. The subjects were never told beforehand that the attempt was to be made upon them. Positive results were obtained in 4 cases out of 9. Among the 5 failures 1 was determined to be due to a very light sleep. This patient without his knowledge was given a little morphin some hours before bedtime, and then chloroform-anesthesia was successfully secured. So it is proper to maintain that this result was obtained in 5 cases out of 9. On waking in the morning the patients had no knowledge of waking during the night or that chloroform had been given.

Pettyjohn[2] records a case in which some teeth were successfully transplanted under chloroform-anesthesia applied during sleep. Chloroform was administered without the child awakening. [High authorities have denied the possibility of inducing anesthesia during sleep That it can be done is proved by the above papers. The *Year-Book* for 1896 cited a case where it was successfully accomplished. The fact is true, but it is of more importance medico-legally than surgically.]

Andrea Ceccherelli[3] has studied the **temperature changes** induced by **chloroform-narcosis.** He states that in anesthesia the temperature is subnormal, but the lowering is not progressively continued to the end of the administration of the anesthetic. The lowering of the temperature oscillates more at the beginning of narcosis than it does at the end. When the temperature touches its lowest point it oscillates about this point, and the more the oscillations are in relation with strong pulse and good respiration the less need there is of apprehending danger to life. Temperature begins to rise when the narcosis is terminated. The longer the narcosis lasted and the lower the temperature, so the longer is the time necessary for the temperature to again reach the normal standard. [Ether also lowers temperature, often as much as 3° to 4° F.]

[1] Rivista Sperimentale di Freniatria, 1895.

[2] Med. Rec., June 4, 1896.

[3] Il Policlinico, 1895, No. 17.

Carmichael[1] of the Edinburgh Royal Hospital for Sick Children asserts that **chloroform** is safer **in a child** than in an adult. Children are much more sensitive to it, and a very much smaller dose is necessary to produce unconsciousness. In children we may practically exclude from the risks attending the administration the degeneration of the heart and vascular system, which is the great danger in adults. The action of the drug upon the nervous system of the child is extremely rapid, and this is the element of safety if the administration is conducted carefully. The action is quick, but the reaction is equally quick. Carmichael does not believe in slow anesthesia, but advocates rapid anesthesia. He holds that in the slow method the patient is longer under the influence of the anesthetic, and is therefore for a longer time in danger; time is allowed for the saturation of the blood, and there is less likelihood of a quick reaction. In the slow method of administration there is a prolonged period of excitement, and in this period the risk is greater than it is at later stages. What Carmichael aims at is what Owen calls **the Edinburgh method**—that is, the administration of as little of the anesthetic as will produce rapid and complete narcosis, as evidenced by the abolition of reflexes and muscular excitability. An overdose is a great danger, but the caution in administration which includes previous preparation of the patient and during administration unremitting attention to the respiration, the circulation, and the nervous system, will ensure safety in the great majority of cases. [We stated before our belief in the slow method rather than the rapid method. The rapid method is apt to suddenly overwhelm the system. A man who can slowly drink a pint of whiskey without obvious harm is put in danger of his life if he gulps it all down at one time. If this is true of alcohol by the stomach, why should it not be true of ether or chloroform by the lungs? Slow administration is safe, rapid administration is dangerous. White has shown that the blood of the carotids after an animal has been killed by overdose of chloroform contains only $\frac{2}{3}$ amount of the drug which is present when an animal has been slowly and safely anesthetized. This proves that not the amount but the sudden administration constitutes the danger. We cordially agree with Carmichael that chloroform is the best anesthetic for children, as ether is apt to cause a profuse flow of bronchial mucus, and this mucus collects and impedes respiration.]

Gay[2] of Boston discusses the present state of anesthesia. He holds that in view of the public opinion of the safety of **ether as compared with chloroform** it is dangerous to the surgeon to give chloroform. If an ill result happens in ether, he may escape blame; if it happens in chloroform, he will be severely censured. Some surgeons prefer chloroform, with good reason, in certain cases. It is quite true, though, that the accumulated testimony of 50 years proves that ether kills slowly, chloroform quickly; that ether kills by the lungs, and chloroform by the heart; that ether gives warning of danger, and chloroform often gives none; that ether is safer in healthy and strong people than in the weak and prostrated, but that chloroform is

[1] Archives of Pediatrics, Sept., 1895.

[2] Therap. Gaz., Nov. 15, 1895.

nearly as dangerous in the vigorous as in the debilitated. Ether requires no special skill in administration, chloroform does. Treatment usually promptly overcomes unfavorable symptoms from ether, and often does no good whatever in accidents from chloroform. Ether is the safest general anesthetic known, and chloroform is not. Hence the burden of proof in the justification of chloroform rests with the operator. Deaths, however, are liable to occur with ether which could not have been anticipated. Chloroform has some notable advantages over ether. Its action is more rapid, it is less unpleasant to take, it is less irritating to the respiratory organs, and is less apt to produce nausea and vomiting. Gay maintains that it is justifiable to employ chloroform in operations upon the respiratory organs. Death from suffocation might occur in these cases when ether is given which would have been escaped if chloroform had been administered. In some cases ether produces great trouble with the respiratory organs and severe after-effects, notably shock. [Genet from a study of thousands of cases considers it proved that ether is safer than chloroform. We agree with Gay that children can be safely anesthetized with chloroform, and also agree with him in the statement that ether may produce serious after-effects.]

Gerster[1] gives the results in 100 cases where he employed **Rosenberg's method** of cocainizing the nasal mucous membrane before and during anesthesia. He gave chloroform in 52 cases, ether in 24, and the A.C.E. mixture in 13. In the other 11 cases more than one of these anesthetics were employed. He found that the feeling of suffocation is often absent at the beginning of anesthesia, this being due to the absence of the patient's perception of the odor of the anesthetic. He found there was very little reflex irritation, which was shown by the infrequency of struggling and coughing, and he noticed that nausea was extremely rare. In a number of these cases there were rapid pulse and great pallor, which he believed were due directly to the cocain. Vomiting followed in only 25% of the cases. [The experiments of Rosenberg and Guerin upon the value of cocainizing the nares before and during chloroform-anesthesia will be found in the *Year-Book* for 1896, p. 328.]

Weir[2] maintains that **ether-anesthesia does not irritate the kidneys,** as is generally believed. He thinks that it has no marked effect upon healthy kidneys, that it is not dangerous in persons with slight kidney disease, and that any circulatory disturbance which may arise in the kidneys very quickly disappears. He reports a large number of cases and considers the views of other observers. [The *Year-Book* for 1896 sets forth the divergent views upon this point, and comments on more of the contradictory statements which have been made. Wunderlich from a statistical study concluded that albuminuria was more apt to be induced by chloroform than by ether. Beck from a statistical study concluded that albuminuria was most apt to be caused by ether. We are thus confronted with carefully compiled reports which are diametrically opposed and absolutely contradictory. The humble surgeon who

[1] Ann. of Surg., Jan., 1896.

[2] N. Y. Med. Jour., Nov. 16, 1895.

venerates statistics too much to use them is lost in uncertainty. We are told that figures cannot lie, and yet only one of these statements can be true. Which is the truth we cannot as yet decide, as we know of no birthmark to prove identity.]

Eisendrath[1] has studied the **influence of ether and chloroform upon the kidneys.** He sums up his results as follows: That though some observers have found that ether had almost no influence on the kidneys, the majority believe that it has a distinct influence on the healthy organs; that this influence is very slight, and is exhibited by traces of albumin and of the varieties of renal elements, and the effects rarely last more than 24 hours; that upon the diseased kidney ether has a highly injurious influence, causing a positive increase in the amount of albumin and the former renal elements. Chloroform acts like ether upon the normal kidney, although its effects last longer and vary in degree according to the length of anesthesia; very protracted chloroform-anesthesia can produce such change in the renal tissues as to even cause death. Upon the diseased kidney, except the amyloid form, its influence is far less injurious than ether.

Eisendrath maintains positively that ether should be used in protracted anesthesia, provided there is no contraindication in the condition of the lungs and heart. In cases of nephritis without secondary degeneration of the heart-muscle, which would be a contraindication to the use of chloroform, the latter agent is preferred to ether. [Patein made 70 observations upon the urine of patients taking chloroform. In 12% of cases albuminuria existed before anesthesia; in 15% of cases albuminuria existed before operation, but during anesthesia; in 73% of cases after operation. He states that the albuminuria usually disappears in a couple of days, and is not developed in proportion to the length of anesthesia. The condition is the passage of serum-albumin at the glomerulus; uric acid and chlorids are somewhat increased. The kidneys are not seriously damaged. H. Fenter has asserted that ether does not affect the healthy kidney, and is not dangerous when the kidneys are but little diseased. In 500 ether cases Butler found albumin only once. In 600 ether cases Kute found albumin 6 times. Selbach says even very prolonged etherization never produces nephritis. Wood thinks that etherization may induce nephritis if the kidneys are diseased. Wunderlich says ether-nephritis does not occur, but chloroform-nephritis does. Becker says acetonuria is apt to appear after etherization. Thus do the masters differ. What are we to believe?]

Cole[2] has made a report upon the use of **oxygen-gas with ether** for anesthesia. He states that the idea of employing oxygen was suggested by a chemist named Carson, who had never seen an ether-narcosis. The necessary paraphernalia are these: Pure oxygen and good ether; a tube 2 ft. in length leading from the cone to the bottle of ether, and another from the same leading to a tank of oxygen; a cone that receives and retains the vapor and that fits snugly over the patient's face, and so arranged that at a little distance

[1] Chicago Med. Recorder, Feb., 1896.

[2] Med. Rec., Oct. 12, 1895.

from the patient's mouth a piece of gauze can be retained moistened with ether, so that ether can be added if necessary without removing the cone. This latter appliance is really not necessary, because it is not difficult to produce anesthesia with only the oxygen-ether. Cole reports a number of cases. The amount of gas used has averaged a gallon a minute. The amount of ether used has averaged for an adult 6 oz., and for a child 3 oz. an hour. The longest time required to obtain complete anesthesia has been 15 minutes, the shortest time less than 3 minutes. The time of recovery has been from 15 to 50 minutes. Salivation necessitating the cleansing of the pharynx occurred in only 1 case. There has been no troublesome vomiting in any case, and in the majority there was no nausea during administration or during recovery. Whenever the flow of oxygen was increased the rapidity of the heart's action was increased; there was easy respiration, no struggling, and no sense of suffocation; in some cases in which temperature was taken no change was noted. [Our experience with oxygen-ether is that it delays anesthesia and never expedites it. It delays it in the same manner air would if mixed in large quantity with the vapor. Further, some cases are not completely anesthetized. We believe in oxygen to arouse patients from ether and prevent unpleasant after-effects, but are not as yet fully persuaded of its value when mixed with ether as an aid and safeguard to anesthesia. Bryant has noted that it requires a long time to anesthetize with the mixed gas, and the anesthesia may not be complete. Curtis does not find the method an improvement. McCosh thinks the oxygen-ether anesthesia is not obtained for a long time and is apt to be incomplete.]

Morrison [1] holds that **oxygen** is extremely valuable in **overcoming the after-effects of ether** in surgical operations. He thinks that it overcomes the nausea and the general depression at once, and cites some cases to prove this contention. He admits that some cases are more benefited from its use than others. In the most favorable cases the results are astonishing. The nausea is relieved or prevented, consciousness is quickly recovered, the breath is entirely deprived of the odor of ether in a short time, and the feeling of malaise is absent. Some few cases are not benefited or are positively harmed by its use. The best method of administering the oxygen for etherization is by the use of a soft-rubber catheter introduced into the nares until the eye of the catheter is opposite the opening in the trachea. [In the Jefferson Hospital this method has been largely employed, and has given great satisfaction. Landau of Berlin has used this plan extensively. He maintains that it prevents headache and nausea, that it abolishes in a moment or two the dusky hue of the face, that it strengthens the pulse, and causes a rapid return to consciousness. Parvin has strongly commended the method.]

Souchon [2] in an article upon uninterrupted anesthesia in operations upon the face and mouth describes his **perfected apparatus** by means of which we can administer chloroform alone, ether alone, or chloroform with ether. A tube is introduced through the nares, and there is not the slightest risk of

[1] Boston M. and S. Jour., Apr. 16, 1896.

[2] Med. News, Nov. 23, 1895.

injecting liquid anesthetic into the pharynx regardless of the force applied to the bulb. [We have used Souchon's apparatus, and think it a valuable aid to operations about the face and mouth. We commented upon it last year.]

The **statistics on anesthesia** are continued by Prof. Gurlt of Berlin.[1] He gives a total of 52,677 narcoses: 31,083 were with chloroform, 15,712 with ether, 2148 with chloroform and ether, 1554 with Billroth's chloroform-ether-alcohol mixture, 1426 with bromethyl, 32 with pental; there were 23 deaths unquestionably due to chloroform, and 8 deaths possibly due to it. Among the cases to which ether was given 5 deaths were due to it, and 1 possibly due to it. There was not a death with the Billroth mixture. Statistics for 5 years show 1 death to every 2909 chloroform-administrations, 1 death to every 6004 ether-administrations, 1 death to every 10,162 with ether and chloroform, and 1 death to 5745 with Billroth's mixture. Gurlt says it is true that ether statistics are better than the chloroform, but ether-anesthesia is often followed by pneumonia. In 30 cases of postanesthetic pneumonia there were 15 deaths; 13 of these cases of pneumonia occurred after abdominal operations. This seems to be due to the fact that abdominal pain causes the patient to suppress the cough. Hence ether-anesthesia is improper for operations upon the abdomen. [The Medical Press and Circular has stated[2] that during the past year there were in the United Kingdom 61 deaths from anesthetics. Schleich says the more the boiling-point of an agent differs from the body-temperature the more dangerous it is as an anesthetic. He has made a mixture of chloroform and petroleum-ether, which mixture boils at the body-temperature, and with this mixture as an anesthetic he has had excellent success, and has met with no dangerous symptoms and no unpleasant results.]

Keefe[3] holds that a patient with a **weak heart** should take **digitalis** for 24 hours before an anesthetic is administered, and should be given a hypodermic injection of a considerable dose just before beginning the administration of the agent. The dose of anesthetic should always be measured. Half an ounce of chloroform is the proper dose to produce anesthesia in a healthy adult, and this should be poured on at once, no more being used except as required to keep up anesthesia; 1½ oz. of ether is enough to render a woman unconscious, and 2 is enough to secure anesthesia in a man. The face, pulse, and respiration should be carefully watched during the administration of chloroform. The respiration and pulse should be carefully watched during the administration of ether. The anesthetizer must not only see the chest move, but must hear the air enter into the lungs. Keefe believes in the combination of chloroform and ether, holding that the stage of excitement is far shorter in duration than when ether is given alone.

Lauder Brunton[4] has made an elaborate study of **chloroform anesthesia.** He says that experiments upon animals have amply demonstrated that when chloroform is inhaled, and not forced into the lungs, death ensues by

[1] Ann. of Surg., Feb., 1896.
[2] Jan. 22, 1896.
[3] Boston M. and S. Jour., Nov. 28, 1895.
[4] Lancet, Nos. 3750 and 3751.

paralysis of the respiratory center, and clinical observation has shown that failure of respiration not unusually occurs during the administration of the drug for surgical purposes. Death may arise from paralysis of respiration, but may also be due to syncope or to cessation of respiration and circulation together, which condition he calls neuroparalysis. Anesthetics never produce neuroparalysis, but rather tend to lessen shock, unless they are administered in such a way as to cause great irritation of the respiratory passages. Choking is apt to arise during imperfect anesthesia, either at the beginning or the end of the administration, and in these cases death by neuroparalysis may arise or death by asphyxia. A patient can usually be reacted from asphyxia by artificial respiration, but neuroparalysis is highly dangerous, and the surgeon should seek to avoid it by removing every cause which might interfere with respiration. The nerve centers are depressed during full anesthesia, and there is more risk of asphyxia than neuroparalysis, but when the reflexes are present, as at the beginning or the end of anesthesia, the respiration must be looked to with the most scrupulous care. The respiration is of far more importance than the pulse. [In spite of the great authority of the distinguished scientist quoted above, we feel sure that deaths have occurred under chloroform from heart paralysis, without signs of respiratory failure. We feel sure of it because most capable surgeons, men well fitted to make accurate clinical reports, have stated so with emphasis. Among surgeons the opinion is general that chloroform kills by way of the heart, and this opinion is drawn from clinical observation. White has, we believe, demonstrated, and so have Percy, Snow, and Richardson, that a large amount of chloroform given rapidly may paralyze the heart, while respiratory failure may happen when the chloroform is given gradually. In rapid administration the circulation is in danger, in slow administration the respiration is in danger. Leonard Hill has recently made a very important contribution to science in a book called "The Physiology and Pathology of the Cerebral Circulation." He maintains that an anesthetic produces a fall of blood-pressure, due partly to vasomotor paralysis and partly to cardiac failure. He shows the interesting point that when the blood-pressure is rapidly sinking, recovery can be brought about by elevating the feet and making pressure upon the abdomen. Ether produces a slow fall of blood-pressure, and chloroform a rapid fall.]

Fingland[1] says that from 8 A. M. to 10 A. M. is **the best hour for the administration** of an anesthetic, as most patients are more cheerful in the morning.

Rein[2] of Moscow maintains that the **transfusion with salt-solution** is of very high value in cardiac paralysis from chloroform-inhalation. This was proved upon animals and has been confirmed upon man. [The difficulty is that cardiac paralysis is apt to take place with such rapidity that transfusion would be impossible unless the tube were inserted into the vein before the operation. There can be no question that transfusion of salt-solution is a powerful stimulant and the very best treatment for severe shock.]

[1] Edinb. Med. Jour., May, 1895.

[2] Centralbl. f. Chir., No. 17, 1895.

Edward Martin [1] in an article upon the **Laborde method of artificial respiration** has reported 7 striking cases to show its value. He says that laboratory-experiments and clinical observation show beyond controversy the value of Laborde's method, and when but one method of artificial respiration can be adopted it is preeminently the best. Any form of artificial respiration, unless the tongue is drawn well forward at the same time, is about as successful in accomplishing results as would an effort to fill a bottle without removing the cork. The Laborde method of rhythmical traction upon the tongue is supplemented by the Sylvester method of artificial respiration during expiratory movements. The Laborde method should be taught as the first and most efficient means of resuscitating the apparently dead.

Fell [2] again advocates the method of **forced artificial respiration** in saving life in chloroform, ether, and nitrous-oxid narcosis. He records a remarkable case in which it was used 4 days and 3 nights upon a physician, with the result that his life was saved. [Fell makes forced respiration by means of a bellows, the air being driven into the lungs through the mouth or through a tracheal tube. Parmenter has spoken highly of the method. In case of collapse during anesthesia tracheotomy is approved of by Poncet, Vanverts, and others. Poncet says it permits of free entry of air by artificial respiration, it allows air to be forced in, and does not interfere with tongue-traction. Eight successful cases have been reported. (See Delaup, New Orleans Med. and Surg. Jour., Apr., 1896.) Tracheotomy acts mechanically when narcosis is due to obstruction, but it is valuable in cases where no obstruction exists, and even when the patient is apparently dead. In these latter cases the action cannot be mechanical. Delaup says it is reflex, and holds that the operation excites the cardiac and respiratory centers, the factors in the reflex stimulation being the incision, the presence of the tube, and the entry of cold air. This procedure is to be resorted to only when other measures fail.]

Prescott [3] maintains that etherization does not cause acute **lobar pneumonia.** He did not find any reference to it in literature, though there is a general concurrence that ether is a cause. He finds the record of bronchopneumonia and inhalation-pneumonia following anesthesia, but does not find any of true lobar pneumonia. The records showed 40,000 cases of etherization, with 3 cases of acute lobar pneumonia. When we reflect on the enormous number of people etherized and the very small number of pneumonias, we are justified in concluding that ether is very rarely the cause of the pneumonia, and that the 3 cases above mentioned may have been merely coincidences. [Occasionally a pneumonia arises after operation, and it is difficult to determine whether ether or chilling of the body was the cause.]

Charles Phelps [4] places on record an interesting and important case in which **vomiting** occurred **during anesthesia** from ether, the result being that the patient was asphyxiated. [Vomiting is apt to occur when the patient

[1] Therap. Gaz., Dec. 16, 1895.
[2] N. Y. Med. Rec., May 30, 1896.
[3] Boston M. and S. Jour., 1895, cxxxii.
[4] N. Y. Med. Jour., Mar. 21, 1896.

is passing into the anesthetic state if the stomach contains food. During anesthesia vomiting may be due to letting the patient come partly out of ether, and the remedy for this is more of the anesthetic. Vomiting may be due to forcing a large quantity of ether upon the patient, and the remedy for this is a breath or two of air and then gradual anesthetization. Occasionally, in spite of scrupulous care, such an accident as noted above may happen. Outpatients who come to have small operations done frequently violate explicit directions and eat largely before operation, and deny positively that they have eaten. In dealing with accident-cases we may find the stomach full. When a patient vomits, the body and head should be turned upon the side, so that the vomited matter will run out of the mouth, and not into the windpipe, and after vomiting the mouth and pharynx should be swabbed out. A patient should be watched after the use of an anesthetic until consciousness returns, lest vomiting or some other accident occur.]

Buxton, the distinguished anesthetizer of University College Hospital in London,[1] presents a very able paper upon **the nature of anesthesia.** He discusses the paths of anesthesia; the peripheral sense-organs; the production of anesthesia; the action of anesthetics; the definition of anesthesia; true and false anesthesia; theories of anesthesia; and effects produced by anesthetics. The article should be read in full by all surgeons. It is original, forceful, and scientific, and cannot be justly represented by limited quotation.

In conclusion, Buxton says: "What, then, are the practical lessons our present knowledge teaches us? In general we must conclude that the action of the anesthetic should be restricted within those clearly defined limits which involve only the higher ganglionic centers—that under no circumstances should incomplete anesthesia be deemed sufficient for even the most trivial operation.

"Of methods our present knowledge allows us to say much, but it is impossible for me to do more than indicate in the briefest way what rules should guide us. All methods involving asphyxial symptoms are open to grave censure. In the case of all anesthetics it is possible to produce unconsciousness and yet to avoid cyanosis. Nitrous-oxid gas, once thought to be an asphyxiant, is now known to be a true anesthetic, and to be capable of being given with oxygen or air, and to produce peaceful anesthesia without any asphyxial phenomena. Of ether the same is true. Of chloroform it must be said that any association between it and asphyxia must lead in the healthy subject to grave peril and in the diseased to fatal results.

"A word further. Close study of the behavior of anesthetics makes me certain that all methods which employ a large quantity of anesthetic substances are faulty. The pneumonia, the renal catarrh, the cardiac asthenia following anesthesia are due, in most cases, not so much to the anesthetic as to the unwary way in which it is employed. When anesthesia is better understood, and those who employ anesthetics recognize more the responsibility they incur, when the examining boards demand of their candidates at least a nodding acquaintance with anesthetics and their uses, then will there

[1] Lancet, Feb. 1, 1896.

be fewer fatalities and more common-sense practice of this branch of the healing art."

Bayer[1] presents a note upon the danger of **anesthetizing diabetics.** He says that a patient with even slight diabetes is apt to become comatose and die under the use of a small amount of anesthetic. He has reported 3 cases of his own and has collected 9 from literature. The coma developed in his cases after the chloroform-narcosis had entirely passed away—that is, from 24 to 48 hours after the operation. It is impossible to predict whether coma will arise or not in diabetics. [Becker of Bonn has published cases in which rapid diabetic coma followed anesthesia, the condition being due to acetonuria. He made an investigation to find out if anesthesia can produce acetonuria in healthy people, and he found that it does so in most of them. The degree of acetonuria bears no relation to the severity of the operation, or the duration of the narcosis, or the form of disease. It usually disappears by the fourth day, but may last for 8 or 9 days. In 1 case Becker found acetone 20 minutes after the beginning of anesthesia. In diabetics the existing amount of acetone is greatly increased. Acetonuria is more certainly induced in children than in adults. This condition bodes no danger to a healthy person, but does to diabetics. (For a consideration of this subject see Tr. Am. Med. Assoc., Jan. 4, 1896, and Therap. Gaz., May 15, 1896.)]

TUMORS AND CYSTS.

The records of an **implantation dermoid tumor of the cranial cavity** are presented by Hartley.[2] The woman was 46 years of age, and received a blow on the head 10 years ago which produced what is believed to have been a slight compound fracture of the skull. For 2 years there was depression, but after this period a prominence became notable upon the forehead to the left of the median line. The tumor was $1\frac{1}{2}$ in. in diameter and $\frac{1}{2}$ in. in height. It was not adherent to the overlying skin. Deep pressure disclosed the fact that there was an irregular bony opening. The tumor did not pulsate. Hartley performed an operation, dissected up the flap of skin and subcutaneous tissue, and found beneath this flap a layer of tissue continuous with the periosteum at the margin of the tumor. The only point at which it was adherent to the skin was opposite to the center of the flap. When this layer was divided an irregularly rounded opening in the frontal bone was disclosed, and behind this opening lay an encapsuled gelatinous mass, the capsule of which was continuous with the layer above as well as with the dura mater. This tumor was removed, the soft gelatinous material which it contained being first spooned out. The cavity was packed with iodoform-gauze and the patient made a complete recovery. The microscopic examination disclosed the fact that the tumor was a dermoid. It was obviously not an endothelioma, as the cyst-wall was distinctly epidermal and did not contain any endothelial cells. It was evidently due to an accidental transplantation of a portion of the surface epithelium or of some of the hair bulbs

[1] Boston M. and S. Jour., July 11, 1895.

[2] Ann. of Surg., May, 1896.

into the underlying connective tissue. Hartley says that this form of cyst is most frequently met on the fingers of shoemakers, carpenters, and tailors, and was first described by Muron in 1868, though he did not realize that injury was the cause. Hartley then reviews the very interesting literature of this subject. He tells us that a fragment of skin may often be carried in at the time of the injury; that, as a rule, the injury kills this piece of skin or disposes of it in the process of healing, but once in a great many thousand times this fragment retains vitality, and after a dormant period of from 4 months to 2 years develops a cyst. [The *Year-Book* for 1896 presents an abstract of Le Fort's valuable article upon traumatic dermoid cysts, p. 182.]

The treatment of malignant tumors by the toxins of erysipelas still occupies considerable attention. Roberts [1] reports 3 cases within the past 6 months, not one of which was benefited. Campanini [2] reports 2 cases in which the treatment was a failure, histologic examination of the tumor showing the absence of any progressive changes. Campanini holds that the treatment is useless, and that serious symptoms often arise during its application. Friedrich [3] treated 13 cases of epithelial carcinoma and 4 cases of sarcoma, the latter comprising 1 endothelioma, 1 osteo-fibro-chondro-sarcoma, and 2 lymphosarcomata. He says that in the case of the cancers some subjective improvement occurred, but in no sense a cure. In the sarcoma the treatment did not obviate the inevitable results. In 1 case, however, there was an improvement which lasted a long time. Injection into the tumor tissue caused redness, swelling, and edema, and in some cases necrosis of the tissues, which necrosis in many cases extended to the tumor base. Metastases were absolutely unaffected by the treatment. After subcutaneous injection a large area of infiltration appeared which did not disappear for 48 hours. Czerny [4] describes his experience with this treatment. He used the mixed toxins of erysipelas and bacillus prodigiosus. He has treated 8 cases—4 of sarcoma and 4 of carcinoma. One case of small round-celled sarcoma was greatly benefited, but at the time of the report was not cured. Czerny says, however, that this 1 case is not absolute proof of the value of the agent, since the patient at the time of treatment was pregnant, and it is well known that tumors such as sarcoma, epulis, and osteophytes sometimes disappear spontaneously, particularly after confinement. The other cases of sarcoma showed but a trivial change; 3 of the cases of cancer were not improved, 1 case was somewhat improved. Czerny concludes that the materials collected are too scanty to admit of the formulation of positive rules for the treatment of malignant tumors, but nevertheless it is desirable to thoroughly test these toxins. He thinks that the injections exercise a specific influence on sarcoma, and under specially favorable circumstances may cure it, causing the tumor to become edematous, to shrivel up and be absorbed, or else to soften and slough. The method, however, cannot take the place of operation, and it is employed only

[1] Med. News, 1895, No. 2, p. 606.
[2] Il Policlinico, July 1, 1895.
[3] Verhandl. der Deutsch. Gessel. f. Chir., XXIV Kongress, 1895.
[4] Münch. med. Woch., Sept. 3, 1895.

in case of inoperable tumors or recurrent tumors or after operation for sarcoma to guard against recurrence. In cancer the injections may delay the progress of the case, but will not cure it. Swain [1] writes an article upon the treatment of malignant tumors by these toxins, and presents a record of unsuccessful cases. McBurney has presented 3 unsuccessful cases. Senn [2] has reviewed this treatment elaborately from the time it originated to the present, and has no faith in it whatever.

[Coley himself and some other observers still maintain the view that the method is of great value. We see no occasion to alter the view we expressed in the *Year-Book* for 1896—that is, that our experience has not been such as to produce faith in the method. Selva has strongly set forth the discrepancy between the clinical reports of Coley and pathological evidences of Councilman. We firmly believe that many reported cures were really instances of mistaken diagnosis. When arguing in favor of the specific curative effect of the toxins one should remember that cures of sarcomata have been reported by high authorities as having been obtained by the injection of alcohol, of anilin, of zinc chlorid, and of other materials. Roswell Park in his recent work upon Surgery says that the toxins are, as a rule, pyogenic and depressing, and that the amount requisite to affect the tumor cells may be more than the general organism can stand with safety. He further says there is reason to think that many different substances when introduced into the system may favorably affect malignant growth *for a short* time, but these results are usually temporary. On March 27, 1895, the New York Surgical Society appointed a committee to investigate the use of erysipelas-toxin and to report upon its value. This committee consisted of Drs. L. A. Stimson, A. G. Gerster, and B. F. Curtis, and it reported on March 25, 1896 (see Annals of Surgery, July, 1896). The report declares that the committee has not found in a single case any amelioration which held out a prospect of cure. In some cases the toxins appeared to hasten the growth of the tumor, and in most cases hastened the cachexia. The report says: "1. The danger of the treatment is very great. 2. The alleged successes are few and doubtful in character, and the most that can be fairly claimed for the treatment by toxins is that it may offer a slight chance of amelioration. 3. Valuable time is often lost in operable cases by pursuing the treatment. 4. The method should never be resorted to except in absolutely inoperable cases."]

The subject of **serum-therapy** in malignant growths was presented in the *Year-Book* of last year, when we discussed the article of Emmerich and Scholl. Domergue [3] reviews the recent observations of Emmerich and Scholl, and maintains that we are justified in applying serum-therapy only to cases of disease due to microorganisms. Cancer is not such a disease, and the facts set forth to prove that serum injections, injections of erysipelas-toxins, or of the juice of a sarcoma are curative prove nothing more than the facts which have been set forth to maintain the curative influence of phosphorus, picric acid,

[1] Brit. Med. Jour., Dec. 7, 1895. [2] Jour. Am. Med. Assoc., July 27, 1895.
[3] Presse méd., June 1, 1895.

anilin, and other agents. These latter materials when injected cause aseptic necrosis. The area of necrosis attracts the white blood-corpuscles, and a true and partial absorption of the tumor takes place. The toxins of erysipelas may occasionally lead to the same result, but the whole disease is never cured. The Centralblatt für Chirurgie, Jan. 11, 1896, comments on some 50 reported cases in which the French observers have used serum-therapy. The experimenters maintain that serum treatment causes great abatement in pain, diminution in hemorrhage, improvement in the ulceration, and favors a tendency to the formation of granulations and scabs; they further assert that under its influence the swelling diminishes, that adjacent infiltrations shrink, that infected glands decrease in size, and that the entire cancer decreases in size—that even in the most severe cases the development of the cancer is positively hindered and the general health is much improved. Bruns[1] treated 5 cancers and 1 malignant lymphoma by this method. In not a single case did the injections prove of the slightest benefit in diminishing the growth of the tumor. Bruns examined the serum and found that it was completely sterile. [The serum-treatment is based upon the same theory as is the antitoxin-treatment of infectious diseases. An animal, usually a horse, is injected repeatedly with fluid obtained from a cancer or with a fluid extract made from cancer. The earliest injections produce some disturbance of the system; the later injections do not excite any reaction. When injections cease to excite any reaction blood is drawn from the animal; the serum is separated and is injected into the patient. Emmerich and Scholl obtain the serum from a "prepared" sheep, and filter the serum before using. Other observers have employed goats, dogs, and asses. The value of this method is entirely problematical.]

The Etiology, Diagnosis, and Treatment of Malignant Disease is the title of an elaborate and able paper by Dennis.[2] It was the presidential address of 1895 before the American Surgical Association. He reviews the whole subject, and every surgeon should read it. Dr. Dennis comments on the unreliability of the statistics in regard to the permanent cure of malignant disease, and he says that the unreliability lies in the fact that surgeons report cures of malignant disease in cases in which the tumors are innocent. He lays down a rule to which there should be no exception: that is, before a tumor is classed as malignant it must be subjected to a microscopic examination by a skilful pathologist, and if this condition has not been complied with, the case must not be admitted into any list of cures. The author does not accept the germ theory of malignant disease. He tells us that the weight of opinion is opposed to it, and that clinical evidence points strongly in favor of the view that changes of an inflammatory nature are responsible for the development of malignant tumors. Mechanic injury is associated with the causation, sarcoma and peripheral irritation with carcinoma. In discussing **eczema of the nipple** Dennis says it is different from the simple eczema observed in other parts, since the usual conditions are absent, such as irritable and dry skin, overwork, anxiety, faulty innervation, vasomotor

[1] Jour. de Méd. et de Chir., Nov. 25, 1895.

[2] Ann. of Surg., Oct., 1895.

disturbances, the uric-acid diathesis, impaired kidney secretion, dyspepsia, etc. It is found where there is no friction or moisture. The disease does not disappear by the use of those agents which cure simple eczema. This eczema is local at first, but its continuous irritation will cause proliferation of the epithelium in the milk ducts. It is at first a chronic affection located in the skin about the areola of the nipple, never extending deep into the tissues. But when this form of eczema occurs in women who have passed the menopause it is very likely to give rise to epithelioma. The eczema is not secondary to breast-epithelioma, since it antedates any evidence of disease in the ducts. The common cause of irritation in the mouth is nicotin. Cases of epithelioma starting in the mouth are often due to this cause. An illustration of the law that persistent irritation of the mouth may cause epithelioma is found in the liability of those who nail laths to get cancer of the tongue, because of the custom of these mechanics to introduce the nails into the mouth and push them out by the tip of the tongue as they are needed. Illustrations of the law that continued irritation is likely to give origin to cancer are seen in the irritation produced by a clay pipe on the lip, and in the irritation produced by the continued pressure of a pair of eyeglasses, and the cases reported by Gerster of rectal epithelioma in patients who were in the habit of carelessly using the nozzle of an injection-syringe. A discharging sinus is a source of irritation to a patient, because the continuous irritation of the discharge of acrid pus may lead to the development of epithelioma. The theory of Cohnheim, that tumors arise from the proliferation of embryonic cells which were displaced during fetal life, and which rapidly multiply in consequence of some exciting cause, cannot be rejected, and any attempt to explain tumor-formation except from vestiges seems futile.

He then considers different special forms of malignant disease, sarcoma in different regions and carcinoma in different regions. He tells us that in England alone there are 7000 deaths annually from carcinoma, and that this disease causes more deaths in the United States in one year than the sum total of deaths due to erysipelas, tetanus, hydrophobia, lightning, typhlitis, gunshot wounds, joint-disease, together with other well-known affections. In the United States cancer in one year causes nearly half as many deaths as are caused by accidents and injuries of all kinds and descriptions—that is, about 14,000 deaths a year.

Dennis analyzed Halsted's figures in regard to the cure of **cancer of the breast,** which have been considered the best published up to that time. Halsted claims that he had 6% of recurrences locally in 50 cases which he reported in 1894; but of these 50 cases the results of 5 he records as unknown, and 25 of them he reports not having reached the 3 years' limit of time. Therefore only 20 cases, instead of 50, can be used in estimating the local or regionary recurrences. Of these 20 cases, 18 died before the 3-year limit was reached, leaving only 2 in which recovery can justly be said to have taken place. Hence Halsted's figures ought to show 10% of permanent cures and 15% of local recurrences, since in the 20 cases there were 3 local recurrences.

Dennis has had 116 cases of breast-tumor, of which 19 were not operated upon, leaving 97 cases in which the breast was removed. In these 97 cases there was 1 death, a mortality of a little over 1%, and this death was due to the presence of hemophilia, and would have occurred no matter what operation had been undertaken. From the mortality of Billroth, 23%, to the present possibility, shows the enormous reduction which has taken place. Of the 97 cases, 74 were carcinoma, and the subsequent histories of 41 are known; 3 of these have not yet reached the 3-year limit of time, and there remain 38 cases with full subsequent histories. In these 38 cases there were 17 cases of recovery, or 45% of permanent cures, and among these 38 cases there were but 2 local recurrences—a little over 5%. Since the publication of the writer's last statistics in 1891 he has had 15 cases of pure carcinoma of the breast without a death. In 13 of these cases full subsequent histories are known: 2 of these died from recurrence and 1 from hemophilia, and the remaining 10 have passed the 3-year limit of time. This gives 77% of permanent cures in the last 15 consecutive cases. In the cases of sarcoma of the breast the subsequent histories are all known: 4 of these cases were cured, $66\frac{2}{3}\%$, and 2 died from a return of the disease. [Dennis thinks the harpoon a valuable aid to diagnosis. We do not so consider it. Small fragments so obtained do not show the structure of the growth, and more often lead to error than to truth. We have seen evidence of this several times.]

The Lettsomian Lectures for 1896 were delivered by Cheyne,[1] who chose as his subject **"The Objects and Limits of Operations for Cancer."** He has presented most ably and impressively his views. This article contains within itself not only the condensation of most of the recent literature upon this subject, but the present views of a surgeon of wide experience, of high scientific attainments, and of great practical skill. These lectures constitute one of the most notable articles of the year. Cheyne's primary proposition is that cancer is, in the first place, a local disease—that early removal and thorough removal means a cure, and that a cure may be obtained in some cases even after recurrence. When a visible portion of disease is left recurrence takes place almost at once, and when invisible portions are left it takes place in most cases within one year. Recurrences are rare after a year, and Volkmann has proved that after 3 years they very rarely happen. Reappearance after 3 years is usually fresh development rather than recurrence, although later recurrences can take place in glands where the cells may have remained dormant from the time of the previous operation. He cites a case where a breast was removed for a cancer 15 years before. A few small glands had been left untouched in the axilla, and only began to enlarge after 15 years. The younger Gross has shown that of all recurrences after breast-operations only 2.3% take place after 3 years. Hence Volkmann's 3-year limit. Freedom from recurrence for 3 years is estimated as a cure. The prospect of cure of cancer is excellent when the growth is superficial and there is room for cutting wide of it. In epithelioma of an extremity the cells are not so small

[1] Lancet, Feb. 15, Feb. 22, and Mar. 14, 1896.

as in cancer of the breast, and hence remain local longer, and the surgeon by amputation can go wide of the disease. Volkmann showed that 51% of such cases could be cured. Cancer on the face gives a rather favorable prognosis, and free removal often brings about a cure. The least favorable of face-cases is lip-cancer, because the muscles are attacked early. But even in lip-cancer Bruns has had 38.2% of complete recoveries and Maiweg at Bonn has had 44%. The combined results of many German operators show that 28.1% are cured.

Jones and Platt[1] consider the **results of operations for cancer of the breast** which were performed at the Manchester Royal Infirmary during a period of 10 years. They form the following conclusions: Cancer of the breast is amenable to treatment by operation, and 12% of cures can be confidently looked for. Nonsuccess in operation is generally due to the extensive character of the disease when the patient first seeks relief. The earlier the operation the greater the proportion of cures. Moderate axillary enlargement does not forbid operation and is not a bar to a successful issue, provided that the axillary space is thoroughly clear. It is impossible to demonstrate slight enlargement of the axillary glands by examining through unbroken skin. No operation for cancer of the breast is complete unless the axilla is examined through the wound. A large number of local recurrences show the absolute necessity of freely removing the disease, taking away all doubtful skin, and not leaving any outlying portions of breast tissue. Operations should not be performed when the entire growth is irremovable or when the supraclavicular glands are enlarged. The only conditions which might render an operation proper under such circumstances is the presence of a foul ulcer, the removal of which will greatly modify the inconvenience of the condition. [Some surgeons consider it justifiable to operate when the supraclavicular glands are enlarged, and others maintain that these glands should be removed in breast-cancer even when they are not manifestly enlarged.]

Lane[2] in discussing the **radical operation for malignant disease of the breast** says that in some cases the ordinary operation may be sufficient, but when there is an extensive involvement the large raw surface which the operation leaves as a legacy is a powerful antagonist to recovery. In such cases he amputates the arm at the shoulder in order to obtain enough skin to cover the raw surface. As in such cases the loss of the arm would in any case result from the dissemination of the disease and death would soon follow, we are justified in doing this because we may obtain full recovery with merely the loss of an arm. He reports a case of perfect cure obtained by this method. [When the axillary involvement is so extensive as to require amputation to effect removal, as a general rule the disease has also passed beyond reach. Cheyne in a previously quoted article opposes this operation. He says amputation of the arm can be necessary only when a mass exists in the axilla which involves the vessels and nerves. Involvement of the artery, vein, or even both vessels, does not necessitate amputation, as he has several

[1] Lancet, Aug. 31, 1895.

[2] Ibid., No. 3763.

times removed portions of the vein, and in 1 case he removed both vein and artery without any subsequent loss of vitality in the limb. He thinks if the disease is so diffuse as to involve the nerves, it has certainly extended beyond reach.]

Sanderson[1] makes a contribution to the **surgical treatment of malignant disease of the breast.** He says it is a commonly acknowledged principle that not only should the whole affected mammæ be excised, but that all its lymphatic connections should likewise be removed. He examines the question as to how far this principle is applied in practice. He says that the efferent lymph-vessels run from the axillary glands through the apex of the axillary into the posterior triangle, and, after forming connections with the glands of this triangle, finally enter the thoracic duct on the left side and the right thoracic duct on the right side. Superficial lymphatics from the skin covering the mammary gland pass up over the clavicle to these same glands in the posterior triangle. It is laid down in primary malignant disease of the breast that the breast should be removed, and that then the axilla should be cleared out whether the glands be visibly affected or not. This rule is laid down because it is well known that because glands are not *visibly* affected is no proof that they are not microscopically affected. In the face of these established facts it is not the usual custom for the surgeon to proceed farther than this. If it is wrong to assume that the axilla is free from disease because it shows no microscopic evidence, it is equally wrong to assume that the posterior triangle has escaped. If it is right to clear out the axilla in every case, it is also right to clear out the posterior triangle. It is absolutely inconceivable why the triangle should be left untouched if the axillary glands are found clearly affected at the time of operation. The operation of clearing out the triangle is not a difficult one. A flap formed by an incision along the sternocleidomastoid muscle meeting an incision along the clavicle is detached as far back as the anterior border of the trapezius. This thoroughly exposes the triangle, so that its contents can be readily removed. Sanderson maintains that by such means an acknowledged principle would be thoroughly carried out, and, if the principle is right, it is incumbent upon the surgeon to apply it thoroughly and not to stop halfway. [The glands in the axilla constitute a net interposed between the breast and the cervical glands, and if a case is operated upon reasonably early, the removal of the axillary glands alone does carry out the principle. Nevertheless, in many cases it is wise to open the posterior cervical triangle. It should be done in all cases of rapidly growing cancer, and should be done in all cases where glands at the apex of the axilla are involved. We say it should be done, and yet we think even this gives but little hope. If the cervical glands are involved, it is almost certain that the thorax is invaded, as the route along the subclavian vein into the thorax is taken by the cancer cells *sooner* than the route into the neck. Arbuthnot Lane advises section of the clavicle as a preliminary to clearing out the triangle, but this step is unnecessary.]

[1] Lancet, Dec. 21, 1895.

The clinical lectures on **the diagnosis of carcinoma of the breast** in its earlier stages by Sheild[1] are a notable contribution to practical surgery. Sheild shows us that cancers of the breast form nearly one-half of hospital cases of breast-disease. When the patient is examined the thorax should be quite undressed and covered loosely with a towel or handkerchief, and both breasts should be carefully examined. He then shows the symptoms of the typical case. The common age of onset is between 40 and 55, though Bryant has seen a case in a woman aged 25, and refers to one by Henry of Breslau in a patient of 21. The oldest patient that Sheild has seen was 78, though Bryant has seen a case at 96. Most patients discover quite accidentally that they have a tumor, and anything like severe pain is exceptional in very early cancer. Pain, if present, is neuralgic, and is not associated with throbbing or special tenderness or heat or redness. Carcinoma of the breast is sometimes insidious in onset, especially in very fat women. This fact explains those cases in which the secondary effect of the disease in causing deposit in other parts becomes more noticeable and sooner prominent than the primary effect. A case of insidious pleurisy may be due to a deep-seated nodule of breast-cancer, and the same may be said of many supposed rheumatic pains about the thorax or bones. Spontaneous fracture of the femur may occur in the same class of sufferers, and also severe pains in the spine terminating in paraplegia. In all such cases examine the breasts, and in a certain proportion of them you will find cancer. Sheild reports a case of scirrhus in the breast of a very fat woman which was merely marked by a dimple in the skin; a case of paraplegia due to vertebral deposits of cancer arising from an atrophic scirrhus of the breast; a case of scirrhus of the breast with secondary growths of the spine; a case of scirrhus of the breast with secondary cancer of the spine and ribs; a case of scirrhus of the breast with hydrothorax; and a case of cancer of the liver with concealed cancer of the breast.

In regard to locality in the breast, there is no preference for one side more than the other. Both breasts are affected simultaneously in about 3% of cases. Most of the growths occur in the nipple, and in the larger proportion of them retraction of the nipple is noted. A favorable site is the upper and outer quadrant, but cancer may originate in any portion of the breast-substance, and if it lies very deep or lies far away from the nipple, retraction of that structure may not occur. Occasionally cancer arises at the thoracic mammary junction, and looks as if it were rather in the skin of the thorax than in the breast. As a matter of fact, however, it usually spreads in an outlying lobule of the breast, and quickly infiltrates the skin, forming a circular ulcer. This form of cancer is especially menacing, because it rapidly attacks the chest walls, not being separated from them by the thick mass of the pectoral muscles. There is generally some amount of truth in popular beliefs, and there is no more strongly rooted idea than the hereditary nature of cancer. Sheild believes that in certain individuals peculiarities of structure or growth may

[1] Brit. Med. Jour., May 30, 1896.

be sufficiently pronounced to become hereditary, but family history is of no great value in aiding one to arrive at a certain conclusion.

Paget found a family history of cancer in 33% of cases, Bryant in 12%. Hardness is one of the most striking characteristics of scirrhous cancer, and it is estimated by placing the fingers flat upon the breast over the tumor. The contour is irregular. A dense and thick-walled cyst, a chronic abscess which is distended and surrounded by inflammatory tissue, or an area of tissue thickened by chronic inflammation may all be exceedingly hard. The cancer is not encapsuled and never moves freely, but the surrounding tissue moves with it. In a very fat breast, where the cancer lies in a semifluid medium, it may have a deceptive sense of mobility. Contraction of the nipple is due to a contracting growth drawing upon the larger milk ducts and fibrous tissue. It may be entirely absent in a cancer which is some distance from the nipple. The strongest single symptom of carcinoma is that there is a hard lump near the nipple, which lump goes on progressively increasing while the nipple goes on progressively retracting. The nipple, however, may be retracted from other reasons. Retraction may be simulated by a congenital imperfection. Retraction may take place because of chronic inflammation, especially when associated with an abscess. A cyst which has emptied itself and shrivelled up again causes retraction. Incisions into the breast for cysts or abscesses may be followed by retraction. In a very rapidly growing cancer there is but little fibrous tissue, and it is fibrous tissue which causes the retraction; hence in a very rapidly growing cancer there is no retraction. Sheild then discusses precancerous conditions, especially eczemas of the nipple. The chronic eczema which is associated with lactation will get well under appropriate remedies, but the condition known as Paget's disease, which is not a real eczema, but a malignant dermatitis, persists in spite of all remedies short of extirpation. Paget's disease arises in elderly women. The area becomes red and raw and looks like an acute balanitis. The raw surface weeps a watery and viscid discharge and is the seat of itching and burning. The tissues about it are thickened. The surface is occasionally covered with white scales, and the integument about it not unusually contains livid red blotches. Many observers claim that they have found coccidia in these cases, but the relation of coccidia to cancer has not yet been determined.

Implication of the skin in early carcinoma is of value in arriving at an early diagnosis. You must distinguish between the dimpling of the skin caused by the contractions of cancer pulling upon the fibrous suspensory bands of the breast, and that peculiar puckering of the skin which is seen when the cancer is beginning to infiltrate. The latter condition resembles the dimpling seen on a coarse pigskin saddle. In a fat breast this dimpling may be the earliest sign of the disease, though you may meet with a similar appearance in an old abscess which has ruptured, in shrivelled cysts, or as the result of incisions in the breast. A rapidly growing cancer may not dimple the skin at all. Hard glands are very common in scirrhus, yet they are often absent in early cases, and their absence does not prove the disease innocent.

The presence of enlarged glands does not prove the disease is malignant, because we may find enlarged glands in the axilla in tuberculous breast-disease, in the initial lesion of syphilis, and in inflammatory mastitis. It is impossible to be sure that the glands of the axilla are enlarged in many cases without opening the axillary fascia. Exploratory incision is occasionally necessary in reaching the diagnosis of scirrhus of the breast. Sheild tells us that the following conditions may be confounded with early cancer: Inflammatory conditions, abscesses, cysts, other tumors, as fibroadenoma, sarcoma, or gummatous infiltrations, phantom tumors, keloid of the breast, and syphilitic skin-affections. He discusses each of these affections in a thoroughly practical way, and reinforces his views by the citation of illustrative cases. The entire article is of extreme value, and should be read thoroughly to be appreciated. [This article contains numerous details of the first importance which are not set forth fully in text-books, and which can only be duly considered in lectures. Such a paper proves, if any proof were needed, that those who advise a system of medical education purely by text-book recitation, without lectures, would create a system which would produce ill-informed practitioners.]

Carr,[1] in a paper on **"The Nature and Treatment of Malignant Tumors,"** advises that in breast-tumors the surgeon should begin his operation in the axilla, so as not to force any cancer-cells from the axilla into deeper tissues while manipulating the breast. The author protests against any operation for the onset of marked cancerous cachexia or the appearance of secondary deposits unless the operation is undertaken as a palliative measure. [The younger Gross, years ago, in a number of cases tried opening the axilla before he removed the breast, and gave it up, because he believed that by such a method his removal of the disease was not as thorough as when he began with the gland itself. The statement that operation should not be done if cancerous cachexia exists is not invariably true. Marked cachexia may exist when there are no secondary growths, and operation may cure cachexia by removing the area from which absorption of toxic products is taking place. We have seen this happen. Operation should not be done when secondary deposits exist, provided we do not consider involvement of anatomically related glands as secondary deposit.]

Gouley[2] discusses the **prognosis of malignant tumors,** and holds that malignant tumors are more frequently met than benign tumors, because of the fact that benign tumors have not been removed in the early period of their growth, but have been permitted to become malignant. He holds that many external benign tumors become malignant, and that some external malignant tumors tend to become benign. The vast majority of carcinomata and sarcomata of the mammary gland are developed from adenomata. The early excision of malignant growths does not invariably increase the chance of cure, but it very generally modifies favorably their progress and prolongs the period of immunity from recurrence, often indefinitely. As soon as the tumor recurs, and as often as it recurs, it ought to be excised. The early

[1] Med. News, Jan. 11, 1896.

[2] N. Y. Med. Jour., Dec. 21, 1895.

excision of external innocent tumors is in reality frequently a prophylactic against malignant disease, and scarcely any tumor is too small to be excised. Gouley of course advocates the removal of adjacent connective tissue and lymph glands when we are removing malignant tumor. Applications of nitrate of silver, arsenic, and other escharotics to tumors are generally worse than useless, frequently cause extension of the local trouble, and in malignant disease frequently lead to dissemination in the organs. The value of constitutional treatment after excision of malignant tumors is great, though there is no such thing as a specific. The internal treatment consists in the use of reconstituents and of such means as will aid in establishing the equilibrium of bodily function.

Lowenthal[1] has collected the reports of 800 **tumors of traumatic origin.** He says that while cancers are more often produced by persistent irritation than by mechanic injury, still cases of the latter sort do occur. Authenticated cases which show traumatic origin may be separated into two classes—those in which the wound never heals, but becomes cancerous, or in which, after healing, the scar becomes cancerous; and those in which cancer forms at the seat of injury or is produced in the wound. The length of time between the alleged injury and the appearance of the tumor has been from a few days to 49 years. The old scar may give origin to sarcoma years after the injury. There cannot be the slightest doubt that injury can give origin to a tumor either innocent or malignant. It may do this by stimulating into growth some depot of embryonal tissue or by causing the normal tissue to take on an embryonal growth. The following table gives the report of his cases:

Kind of tumor.	Number of individuals.	Head.	Face.	Neck.	Breast.	Back.	Abdomen.	Urinary organs.	Genital organs.	Pelvis and lumbar region.	Upper extremity.	Lower extremity.	Multiple tumors.
Carcinoma	358	16	103	1	152	2	8	15	17	. .	18	26	
Adenoma	10	. .	. .	. .	9	. .	1						
Fibroma	21	3	2	1	3	2	2	. .	. .	. .	4	4	
Lipoma	16	5	1	1	. .	1	. .	. .	. .	. .	6	2	
Myxoma	8	3	. .	. .	. .	. .	1	. .	1	. .	. .	3	
Chondroma	27	. .	. .	. .	4	. .	. .	. .	2	2	9	10	
Osteoma	18	1	2	. .	. .	. .	. .	. .	. .	1	3	11	
Angioma	5	. .	2	. .	. .	. .	. .	. .	. .	. .	2	1	
Myoma	2	. .	. .	. .	. .	. .	. .	1	1				
Glioma	11	11											
Neuroma	8	. .	. .	. .	. .	. .	. .	. .	. .	. .	6	2	
Sarcoma	316	54	24	9	30	7	8	4	21	12	42	103	2
Total	800	93	134	12	198	12	20	20	42	15	90	162	2

Tilmanns[2] discusses the **etiology and histogenesis of carcinoma.** He believes in the hypothesis of Thiersch-Waldeyer, that carcinoma takes origin from glandular and superficial epithelium which preexisted—that it

[1] Arch. f. klin. Chir., Bd. xlix. Heft. 1 and 2.

[2] Verhandl. der Deutsch. Gesells. f. Chir., XXIV Kongress, 1895.

disarranges the normal tissue structure at the point of origin, forming grooves unconfined at the periphery, and leads to a general infection or death of the patient through growth in the lymph channels or in some few instances through the blood-vessels. Because a growth is atypical it is not necessarily carcinomatous. Carcinoma grows in an irregular manner or is without a capsule, and infiltrates adjacent tissue, and the cells become detached and cause metastases. Carcinoma can easily develop, because of irritation, from an atypical non-malignant growth. The hypothesis of Cohnheim cannot be unreservedly accepted, although it does explain satisfactorily the formation of some tumors, as, for example, dermoid cysts, rhabdomyomata, tumors springing from displaced cells of the suprarenal capsules, from accessory thyroid glands, etc. The most modern view is that of Ribbert, who maintains that carcinoma does not begin in the penetration of epithelial cells in the connective tissue, but from the growth of the subepithelial connective tissue. This subepithelial growth lifts up the epithelial cells, disturbs their proper relation, and envelops them in connective tissue; and these cells then proceed to grow in the lines of least resistance—that is, in the lymphatic passages and the spaces of the connective tissue. Tilmanns exhibits the view of Ribbert as to the origin of cancer, and maintains that in many cases of carcinomatous degeneration the connective-tissue degeneration remains entirely passive. It is held by Hauser that metastases do not invariably form in carcinoma. Tilmanns does not believe that the cells possess any outward sign by which they can be differentiated from normal tissue cells. The bacterial origin of carcinoma is entirely unproved, and even the presence of sporozoa has not been satisfactorily demonstrated. In some instances the transplantation of carcinoma has taken place. This occurs by autoinfection or by infection from one animal to another of the same species. But transplantation from one species of animal to another species has never been successfully carried out. A person who already has a cancer is strongly predisposed to receive transplanted cancer. Nevertheless, we have no right to regard cancer as a true contagious disease. When we observe an instance even of a successful transplantation of cancer, we are not justified in stating this as an evidence of contagion; it is merely a successful transplantation of the tissue. The author tells us that metastases are very frequent in bone and are very rare in the spleen. The blood-changes of carcinoma are practically the same as those in fever. The strongest predisposing cause of cancer is prolonged irritation, and this is especially true in those beyond middle life. Tilmanns dwells on the statistics of Williams, which exhibit the advancing increase of death-rate from cancer, especially in England, in which country the death-rate is 4 times greater than it was 4 years ago. [The question of the transmissibility of cancer is debated in the *Year-Book* for 1896.]

White[1] has employed **thyroid extract in treating cicatricial keloid.** The case in which he used it had been unimproved by other plans of treatment. There had been used upon it ordinary salves, sorbefacient oint-

[1] Univ. Med. Mag., 1895, vii. p. 812.

ments, pressure, and the internal administration of potassium iodid. White gave the thyroid extract in 5-grain tablets, administering from 2 to 4 of these daily, and applied collodion locally. At the end of 6 weeks the scar had reached the level of the adjacent skin and the hardness at the base had disappeared. [In the out-patient department of Jefferson College Hospital 2 cases were recently cured by collodion alone. In several cases thyroid extract was employed without apparent advantage.]

Wharton[1] discusses the **treatment of nevus,** and concludes that small capillary nevi are best treated by the application of pure nitric acid or by excision. For portwine marks he advises multiple scarification or electrolysis. In venous nevi he performs excision whenever possible, but if this operation is impossible he advises ligation or the actual cautery or electrolysis.

Sutton[2] reports a case in which he excised the upper half of the fibula for the cure of a sarcoma of that bone. He tells us that sarcoma of the femur or humerus is the most malignant tumor known, and is three times more deadly than a histologically identical sarcoma which arises from the bones of the leg or the foot. In view of these facts he thinks it is a very severe measure to amputate the leg for a sarcoma of the fibula. He concludes that the scarcity of records shows that periosteal sarcoma of the fibula is neither a common nor a very malignant tumor. Sutton says that a surgeon may be in active practice for a quarter of a century in a hospital situated in a large town and not be confronted with more than 3 examples of this condition.

Subtendinous exostosis is discussed by Brackett,[3] who reports a case. The tumor was taken away with a chisel, which procedure laid bare cancellous tissue. Examination of this tumor showed it to be what is known as exostosis cartilagina. The result was cure. Brackett says that the situation of the growth was such that whenever the patient attempted to walk it produced mechanical irritation of the tendon. These cases clinically resemble bursitis, and may be accompanied by bursitis. This can be differentiated from pure bursitis by the fact that the swelling is lower down and is hard, and never entirely disappears either from rest or compression. The microscopic examination of this specimen indicates that it arose as a nonsuppurative bursitis or ulceration in periosteal thickening and new bone formation. [This case seems to have been Albert's disease, bursitis of the bursa between the olecranon and the Achilles tendon, and periostitis at the insertion of the tendo Achillis.]

Snow[4] presents a note on **Cystic Degeneration of the Mammæ,** with 3 cases of recurrence on the opposite side. Snow says that we often hear breast-tumors spoken of as simple cysts, but that simple cysts very rarely occur in women verging on middle age, though in the young a dilated milk-duct is often seen, and may be thus designated. After the age of 34 cyst-formation is invariably due to general aberration in the evolution of the entire parenchyma of both mammæ. There may be found only a single cyst of sufficient size to appreciate, but with these are always associated numerous small

[1] Therap. Gaz., July 15, 1895.
[2] Brit. Med. Jour., May 2, 1896.
[3] Bost. M. and S. Jour., Jan. 9, 1896.
[4] Lancet, Nov. 16, 1895.

cysts uniformly distributed throughout the gland. If the case is not operated upon, the entire mamma will become a mass of cysts in which sooner or later intracystic vegetations, carcinomatous or sarcomatous, will develop. These cysts are caused by any emotional or mechanical hindrance to the physiologic processes by which the glands pass to their obsolete condition. If between the cysts there is excessive formation of white fibrous tissue, we speak of the condition as cystic fibroma. The operation should consist in the removal of the whole breast-tissue, and the surgeon should give a guarded prognosis as far as concerns the appearances of the disease in the remaining organ. He reports 3 cases in which after removal it recurred on the opposite side.

DISEASES OF THE ABDOMEN.

THE STOMACH.

Weir and Foote[1] have published an elaborate paper upon "The Surgical Treatment of **Round Ulcer of the Stomach** and its Sequelæ, with an Account of a Case Successfully Treated by Laparotomy." The authors state that gastric ulcer is one of the commonest of diseases, it having been estimated that of the population of Europe 4 or 5% labor under it. Some have estimated as high as 13%, and Fiedler, who examined postmortem 2200 stomachs, found ulceration or its scar in 20% of the women and 1½% of the men. Recent investigations do not sustain the statement that most ulcers occur on the posterior wall and lesser curvature. Ewald says that ulcer forms especially in the greater curvature and in the pyloric region, that part of the stomach which sustains the impact of irritating food, and also that part which hangs lowest when the patient is upright, and in which stomach contents therefore collect. The ulcer is usually single, but two or more may be present, and Orth says that in 20% of the patients with gastric ulcer more than one ulcer is present. This fact has an important bearing upon the surgical treatment of nonperforating ulcers. The great majority of cases of gastric ulcer are successfully treated by rest in bed, appropriate diet, with perhaps rectal feeding for a time, sedatives and laxatives, followed by tonics. But in some cases these measures fail to relieve the symptoms, and in others complications arise, notably perforation, hemorrhage, and violent gastralgia. In still others the ulcer or its scar obstructs the pylorus or causes adhesions between the stomach and adjacent structures. In such cases we must consider the measures of operative relief, and operation is most imperative when an ulcer is perforating or has perforated. Comte has estimated that perforation occurs in about 14% of cases of nonmalignant gastric ulcer, and that when it does take place it is almost invariably fatal. Barling says that 95% of patients after perforation certainly die without operation is done, and among the 5% of reported recoveries are some in which there is decided doubt about the diagnosis. When perforation does take place 1 of 3 conditions obtains: A general peritonitis because the stomach-contents have escaped into the peri-

[1] Med. News, Apr. 25, 1896.

toneal cavity, the adhesions having been scanty. This condition is the usual one in anterior perforations, because in anterior perforations adhesions rarely form on account of the mobility of the anterior stomach wall and the adjacent viscera. In the second condition, which may possibly arise, there are some adhesions and the abdominal contents slowly escape. In these cases there is localized peritonitis which may advance to an abscess, or the barriers of lymph may give way and a general peritonitis may follow. If the perforation presents posteriorly, the lesser peritoneum may become involved and subphrenic abscess form. In rare cases it happens that an adherent perforation produces an abscess of the liver. The third condition which may arise is adhesion of the stomach and discharge of its contents into a hollow organ. This is, however, a very unusual complication. When perforation occurs into the general peritoneal cavity the case is desperate, although there are some dozen cases on record in which recovery has taken place without operation after undoubted perforation, and in some of these cases evidences of healed perforations have been found at subsequent autopsies. Pariser has collected 14 well-authenticated cases, but rest and rectal feeding offer so slender a hope of recovery that without the help of surgery the truth of Leube's statement becomes evident—that is, when perforation occurs the only treatment is to induce euthanasia.

In recent years surgical relief has been thought of as applicable. In 1883, Nelson C. Dobson lost a patient from gastric perforation, and the autopsy showed that the opening was on the anterior wall; and Dobson was impressed with the fact that it could have been reached surgically, and he advocated in similar cases operative interference. This idea had been held by others. In 1880, Mikulicz sewed up an opening in the lesser curvature of the stomach of a man. The patient died. His history was unknown, but it seemed probable that the perforation was not due to a recent ulcer, but to traumatism, a giving way of the site of the cicatricial ulcer. In 1885, and again in 1887, Czerny operated unsuccessfully for perforated ulcer. In 1889 Von Wahl, and in 1890 Mouisset, published each a fatal case, and in 1892 Weir published a fatal case. The first successful case was published by Kriege in 1892. Weir and Foote report a case in which recovery was uneventful.

Subphrenic abscess is an abscess arising from the perforation of a gastric ulcer, and is situated to the right or to the left or behind the stomach. This form of abscess can also arise from other than gastric lesions. It can come from disease of the gall-bladder, the liver, the spleen, the kidney, the duodenum, and the appendix. The pus may be extraperitoneal, which is rare, and is then commonly of renal origin, or it may occupy some portion of the lesser peritoneal cavity, or be limited to the space between the cardiac end of the stomach, diaphragm, and spleen or liver upon the right side. It rarely breaks into the general peritoneal cavity, but progresses slowly. It pushes up the diaphragm on the affected side, and frequently bursts into the pleural cavity or lung.

Maydl in his recent article in 1894 collected 10 cases of operation with 3

recoveries, and Comte found 13 others with 8 recoveries. Beck has had 3 successful cases, Abbe has had 2 fatal cases, and Weir 5 fatal cases, making, with McCosh's case, a total of 34 operations with 15 recoveries.

Weir and Foote then discuss the operations for nonperforating gastric ulcer and their sequelæ. These operations may become necessary because of adhesions, of pyloric stenosis, or of irregular gastric contractions. Sometimes ulcers in the pylorus may require to be resected, as in the case in which Keen removed from the lesser curvature a gastric ulcer. These points have been elaborately dealt with and the article is worthy of careful reading. [The first successful operation for gastric ulcer was performed by Rydygier in 1881, and the second by Czerny in 1882 (Greig Smith). In ulcers which cause considerable pyloric obstruction Doyen of Rheims advises the performance of gastroenterostomy. Both Curtis and Doyen have performed pyloroplasty for the same condition. Mr. Paul[1] expresses the following views as to the causes of failure after operation, and as to the best means to secure success. Failure may be due to collapse, imperfect cleansing of peritoneum, or leakage at suture line. In order to avoid collapse operate in stage of reaction before the development of marked peritonitis, and do the operation as quickly as possible. Cleanse by flushing with a large amount of water at a temperature of 100° F. Do not drain unless peritonitis has begun. Leakage may be due to the inaccessible situation of the ulcer. If it is found impossible to securely suture, it may be well to drain the stomach by a temporary gastrostomy. In some cases we can incise the anterior wall of the stomach, suture an ulcer on the posterior wall from within the stomach, and then close the incision in the anterior wall. Greig Smith's discussion of this subject in the fifth edition of his work upon Abdominal Surgery is altogether admirable. We advise the reader to consult it for full information.]

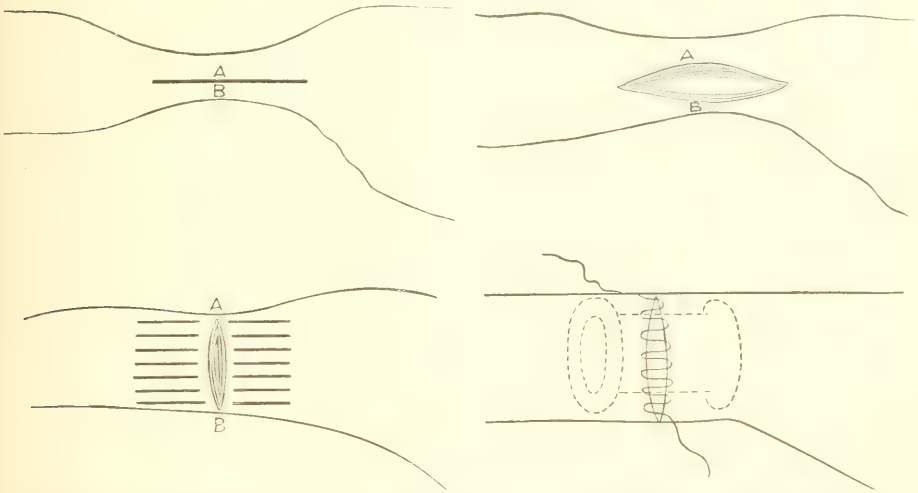
A. W. Mayo Robson[2] advises a **modification** of the usual operation **of pyloroplasty** for stricture of the pylorus. The principle of the operation of pyloroplasty is to obtain increased caliber by longitudinal incision and transverse suture. The operation was devised by Heineke in March of 1886, and a second operation was performed by Mikulicz in January of 1887; hence the procedure is often known as the Heineke-Mikulicz operation. Robson believes that pyloroplasty will completely replace Loreta's operation of divulsion, for there is less immediate risk and a far better prospect of freedom from relapse. He modifies the operation by the use of a bone-bobbin. By the use of the decalcified bone-bobbin only 2 continuous sutures are required—the first to unite the mucous margins, the second the serous edges. The bone-tube at once secures a thoroughly patent channel, and protects the line of sutures for from 24 to 48 hours, when union should be established.

Robson then reports a case to exhibit the value of the method. He says it can be done very quickly, with little exposure of the viscera, and that postoperative shock need hardly be feared, as the incision through the pylorus is through cicatricial tissue, and there is little or no fear of hemorrhage. In the

[1] Medico-Chir. Jour., No. 29, 1895.

[2] Brit. Med. Jour., July 20, 1895.

2 cases he reports not a single ligature was applied. The only difficulty is that the pylorus has to be separated from the adhesions set up by the inflammation which caused the stricture. They are better separated by the fingers than by a cutting instrument. The longitudinal incision should be made in the lower margin, so that when the slit is sutured transversely the upper angle is well within view. He uses fine catgut to unite the mucous margin and fine silk for the serous surfaces. He has found the same operation very satisfactory in simple stricture of the intestines. The annexed cuts make clear this method (Figs. 27–30).



FIGS. 27-30.—A modification of the operation of pyloroplasty (Robson, in Brit. Med. Jour., July 20, 1895).

Paci[1] records a case of **intractable vomiting** which seriously endangered the life of the individual. Celiotomy was performed, and a stenosis of the pylorus was discovered, due to a perforating ulcer. The Heineke operation was performed and the patient made a thorough recovery.

Quénu[2] gives his views upon the **surgical treatment of carcinoma of the stomach.** He concludes that if the cancer is diffuse, if it is very adherent, if it involves many lymphatic glands, the surgeon should simply attempt palliation and should perform gastroenterostomy. If the cancer is operable, he advises the performance of gastroenterostomy, followed in 8 or 10 days by pylorectomy. He believes in a preliminary gastroenterostomy to enable us to build up the patient's strength before the more serious operation, and he thinks that the secondary pylorectomy can be done more rapidly than could a primary case.

C. H. Golding-Bird[3] of Guy's Hospital furnishes a note upon the **after-treatment of gastrostomy** cases. He says that the great trouble which attaches to the after-treatment of these cases is the tendency to leak, and this leakage of the stomach-contents digests the skin around the opening. His

[1] Il Policlinico, Oct., 1895.

[2] Rev. de Chir., No. 10, 1895.

[3] Brit. Med. Jour., Jan. 4, 1896.

plan is as follows: He attaches the stomach to the abdominal parietes, and at the end of the 4th day after this operation opens the stomach just sufficiently to admit a No. 10 catheter, and then dilates this opening with laminaria tents until it is possible to introduce a short rubber tube the thickness of the fore finger. This tube is tied in situ, and the stomach-walls contract firmly around the tube and absolutely prevent leakage. The tube just projects into the stomach and reaches about 1 in. externally. It is kept corked, and the cork is removed at meal-times, when the patient is fed through a funnel and a temporary tube that will pass through the lumen of the permanent tube. The skin about the tube is smeared with boracic acid ointment which contains a large quantity of chalk. This preparation will counteract any acidity should regurgitation happen at any time. Golding-Bird says that if we make the opening in the stomach with a knife and at once insert a large tube, the subsequent contraction will grip the tube, but will not prevent leakage, for there is only cicatricial contraction to rely on; but if the opening is made by dilatation, the gastric muscle remains uninjured and acts like a sphincter around the tube, and this gives us an active as well as a passive hold. [Frank's method, it is asserted, gives most satisfactory results (see *Year-Book* for 1896). The fistula does not tend to dilate, as it does in other methods, and there is no leakage. Linderer, who has performed it 9 times, thinks it preferable to all other plans. Witzel's method is excellent, and is not followed by leakage. Golding-Bird's method impresses us somewhat favorably, and we will try it when opportunity presents.

Mr. Harrison Cripps[1] thinks that the chief trouble after a gastrostomy is leakage. He has devised the following plan to prevent it: "A circular disk of sheet india-rubber the thickness of a shilling is cut. Its diameter should be nearly double that of the orifice to be closed. A thread of No. 4 silk is passed by a needle a little to one side of the centre of the disk, and is passed back again, coming out a little distance from the original puncture and on the same side (see Fig. 31, *B*). The two ends of the thread are now parallel to each other, and should be left 6 inches long. The india-rubber disk is now folded into a circular roll and kept in this position by a fine pair of dressing forceps (Fig. 31, *A*). The roll is thus introduced lengthways through the orifice into the interior of the bowel or stomach, and when released from the forceps immediately expands to its original circular form. By drawing up the two strings the disk is lifted up against the mucous surface, and in this way effectually stops anything coming through. Indeed, the greater the pressure of the fluid within, the firmer is the disk pressed against the mucous wall. A little roll of lint the thickness of a pencil and an inch long, stiffened with a pin or a piece of wire down the centre, is laid over the external opening between the two strings, which are then tied in a bow across it, with just sufficient firmness to press the roll well down on the skin (see Fig. 31, *C*). It requires some experience in each particular case to find the exact size and thickness of the disk required.

[1] Brit. Med. Jour., June 6, 1896.

"For feeding the patient or obtaining relief all that is necessary is to untie the bow, remove the lint roll, and then, holding the thread lightly, press back with the director the disk into the bowel. It can be at once drawn back again

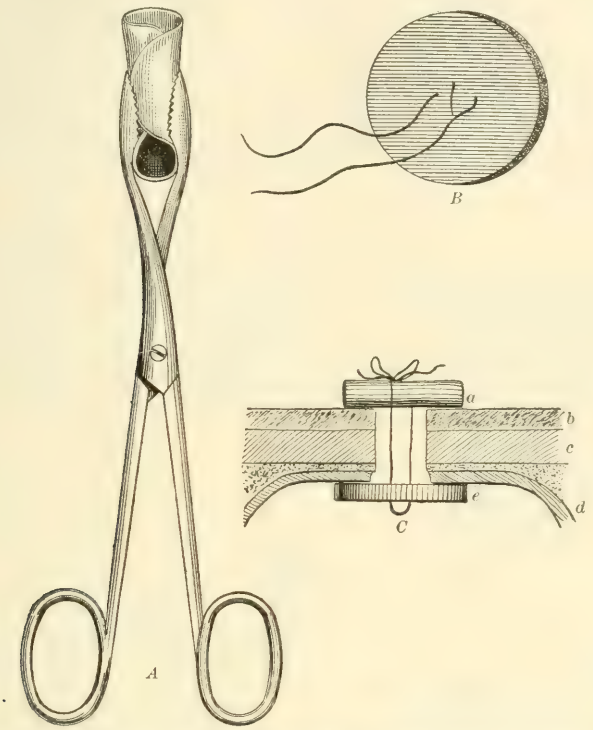


FIG. 31.—*A*, disk rolled up in forceps for introduction: *B*, disk with silk thread; *C*, disk and roll of lint in position: *a*, roll of lint; *b*, skin; *c*, abdominal walls; *d*, wall of bowel or stomach; *e*, disk in position (Cripps, in Brit. Med. Jour., June 6, 1896).

into position when required. I have found this method absolutely effectual in keeping the patients dry and clean."]

Galliard[1] reviews the subject of **pyloric obstruction from gall-stones,** and he reports several cases in which patients had vomited gall-stones or had passed them through the stomach-tube. In some cases the obstruction arises from an ulceration of the stones directly into the stomach-cavity after the formation of adhesions between the stomach and the gall-bladder. In some cases the gall-bladder becomes adherent to the pylorus, and the pylorus, being fixed to the gall-bladder, is immovable, and the stones which distend the gall-bladder diminish by pressure the lumen of the pylorus. In some cases the obstruction is due to the constriction of adhesions between the stomach and the gall-bladder. It is impossible to certainly diagnosticate such conditions except when gall-stones are obtained from the stomach by vomiting or by the use of a tube.

Francis S. Watson[2] of Boston reports an extremely interesting case in

[1] Am. Jour. of Med. Sci., Jan., 1896.

[2] Boston M. and S. Jour., Apr. 2, 1896.

which **hour-glass contraction of the stomach** followed the cicatrization of a gastric ulcer. He performed an operation by establishing an anastomosis between the cardiac and pyloric portions by a new method. The patient completely recovered and her health was entirely restored. Watson had expected to find cancer when he operated. The incision is shown in Figure 32. When he examined into the condition after the laparotomy, it seemed that gastroenterostomy, a plastic operation by longitudinal division and transverse suturing, and resection of the cicatrix were the only operations applicable (Figure 33 shows the condition of the parts). It seemed to him, however, that it would be better to establish an anastomosis between the upper and lower parts of the stomach instead of between the stomach and the intestine, and in this way to retain the useful function of the natural outlet of the stomach. He did not care to em-

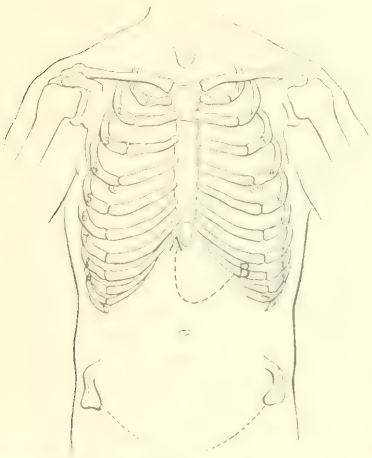


FIG. 32.—*A-B*, line of incision (Watson, in Boston M. and S. Jour., Apr. 2, 1896).



FIG. 33.—Showing position of stricture (Watson, in Boston M. and S. Jour., Apr. 2, 1896).

ploy the plastic operation, because of the great amount of cicatricial tissue present and the difficulty of securing a wide opening; resection of the cicatrix seemed to involve a great deal of danger, so he devised the operation herein indicated. The pyloric portion of the first part of the duodenum was lifted upward and turned over on the cardiac portion, the constricted part acting as a hinge, and was united to it by a single row of fine silk sutures in the form of an ellipse 4 in. in length and $1\frac{1}{2}$ in. in width. One suture was left long on either side of the end of the ellipse (Fig. 34). This complete junction of the two portions before making the incisions was done to avoid spilling any of the stomach-contents into the peritoneal cavity. He now made an incision into the upper part of the pyloric portion in order to gain access to the sutured surfaces. Through this opening he established communication 3 in. in length (Fig. 35). This allowed examination of the stricture from within the stomach. The constriction was very dense and barely admitted the little finger. The edges of the communicating incisions were sewed over so as to prevent their uniting (Fig. 36). The incision through the pyloric portion of the stomach was rapidly sutured, the stomach returned to the abdomen, and the abdominal wound completely closed. The patient was fed by nutrient enemata for the

first 5 days, and was then given liquids by the mouth. On the 10th day she was given solid food. On the 21st day she was eating heartily and out of bed. It is now 5 months since the operation. The patient has resumed her work; her gain in weight is 27 lbs. She is in excellent health. (Figure 37 shows the form of the sutured areas.)

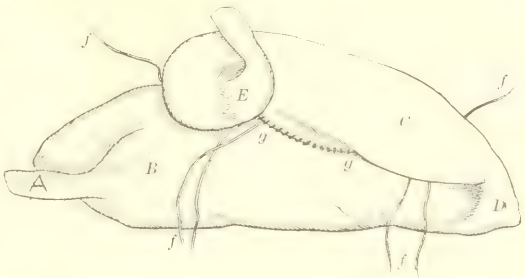


FIG. 34.—Showing the pyloric end laid upon the cardiac end of the stomach, and united by the ellipse of sutures, one side of which is shown (*f, f, f, f*); *g, g*, is the incision through which the interior of the pyloric part of the stomach was entered, after the two parts of the stomach were wholly united, in order to make the communicating incisions (Watson, in Boston M. and S. Jour., Apr. 2, 1896).

When Watson operated he was not aware that any operation like this had been done before, but he subsequently found that Wolf had performed a similar operation in 1894, and Eiselberg had also done it in the same year. Watson's case is therefore the third on record. The appended cuts exhibit the method of operating. [Weir and Foote in a paper previously noticed (p. 266) discuss the question of hour-glass stomach, and state that this condition "has three times been operated upon in substantially the same manner—viz. by establishing an anastomosis between the two halves of the stomach." Wölfler reported a successful case;[1] Watson reported a successful

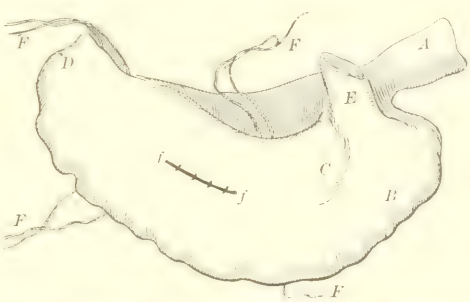


FIG. 35.—Showing the incision through the upper surface of the pyloric portion of the stomach (*f, f*), and the four long sutures (*F, F, F, F*) which served as guides to indicate the line of the uniting sutures (Watson, in Boston M. and S. Jour., Apr. 2, 1896).

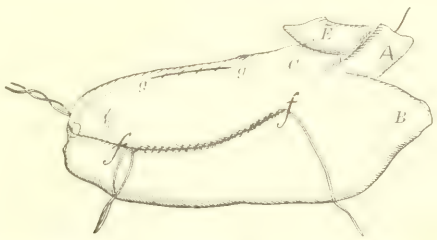


FIG. 36.—*A*, esophagus; *B*, cardiac end of stomach; *C*, pyloric end of stomach; *D*, stricture; *E*, duodenum; *f, f, f, f*, sutures left long to indicate the line of sutures joining the two parts of the stomach; *g, g*, a part of the suture joining the two parts of stomach; figure shows the other side of the two united parts of the stomach (Watson, in Boston M. and S. Jour., Apr. 2, 1896).

case (p. 271); Eiselberg performed the operation, but the line of suture leaked and the patient died.[2] Weir and Foote do not favor the anastomosis

[1] Beit. z. klin. Chir., 1894, vol. xiii. part i. [2] Archiv f. klin. Chir., 1895, vol. i. p. 919.

between the two halves of the stomach, but prefer gastroenterostomy A single anastomosis may be made posteriorly at the constricted part, in association



FIG. 37.—The stomach is here represented as being turned back to its original position in order to show the form (*A, A, A, A*) of the sutured areas which united the two parts of the stomach. The communicating incisions (*B, B*) and the position of the four long sutures (*C, C, C, C*) which served as guides to indicate the limits of the sutured areas (Watson, in Boston M. and S. Jour., Apr. 2, 1896).

with a Mikulicz-Heineke incision anteriorly, or "a double gastroenterostomy may be performed, tapping each sac of the stomach." (Weir and Foote refer to Von Hacker's "Magenoperationen," 1895).]

PERITONEUM.

Alexis Thomson[1] of the Edinburgh Royal Infirmary presents the surgical aspects of **peritoneal tuberculosis.** He tells us that it is a clinical fact that tubercular disease in the peritoneum is benefited by surgical exposure, but there are no anatomic and physiologic facts known to us which explain why this is true in the peritoneum, though not true in the pleura, synovial membranes, tendon sheaths, skin, and other organs and tissues. [The anatomy of the peritoneum does differ from that of other serous membranes. The lymphatics are present in greater number and have less regular channels (Morris).] Cases of tubercular peritonitis subjected to celiotomy have been recorded by many surgeons following different methods. Benefit has resulted whether the peritoneal cavity was irrigated or simply inspected, whether drainage had been used or not, whether iodoform or some other supposed antitubercular agent had been introduced or such procedure had been omitted. It was assumed by many that the removal of the ascitic fluid was the explanation of the cure of some of the cases, but this cannot be the essential factor, because there is but little improvement in cases which have simply been aspirated, because improvement has followed celiotomy where there was no fluid to evacuate, and because in cases in which surgeons had operated and found fluid circumscribed or encysted beyond reach recovery followed, although the fluid was permitted to remain in the abdomen. Some regard the admission of air into the peritoneal cavity as the curative agent, but it is improbable that this has any influence. Other theories have been set forth to explain these im-

[1] Practitioner, Nov., 1895.

provements—the escape of ptomains and toxins, the entrance of antagonistic organisms, the exposure of the peritoneum to sunlight, and the use of an anesthetic and the alteration of the intraabdominal pressure. Thomson believes that the incision itself is the one constant and essential factor in bringing about a cure. The benefit is due to the effects of the operation per se, and not to any particular method of operation. Tubercular peritonitis not infrequently terminates in spontaneous recovery. In the peritoneum the tissues and the bacilli seem to meet on more or less equal terms, and it requires only a little assistance to enable the tissues to obtain the upper hand. An incision may reinforce the tissues or stimulate their energies. There are many clinical evidences in favor of this view. Thomson has had 3 cases in male children in which there was tubercular disease in the patent vaginal process and in the general peritoneum, in which it was found that excision of the tubercular vaginal process or simple incision of the process was followed by cure of the peritoneal tuberculosis. Such cases have been reported by Harold Stiles and others and by Goldmann. The operation upon the vaginal process is analogous to laparotomy for tubercular peritonitis, both operations being followed by improvement which cured all the tubercles diffused throughout the peritoneum.

Thomson then cites a very remarkable case in which a large tubercular tumor involving the cecum entirely disappeared after an exploratory operation. The woman was supposed to be suffering from recurrent appendicitis, and there was a well-marked, firm, and movable tumor in the iliac fossa. Annandale, after opening the abdomen, discovered the cecum, which was firm and solid and crumpled, with the vermiform appendix fused to it posteriorly and inferiorly, and below the adjacent coils of ileum studded with miliary tubercles, with notable enlargement of the mesenteric glands. One of these glands was removed, and later examination proved it to be tubercular. The tumor of the cecum was not interfered with and the wound was closed. Nine months after the operation she was completely well and there was no trace whatever of a tumor. The disease in this case apparently involved all the coats of the infected segment of the intestine. It is a matter of congratulation that the affected portion of the bowel was not resected according to the routine practice of some operators. [Greig Smith recently discussed the spontaneous disappearance of abdominal tumors. (See *Year-Book* for 1896.)]

Thomson next recalls to our minds the fact that cases have been recorded by Greig Smith, Crawford Renton, and others in which exploratory celiotomy disclosed supposed inoperable tumors, which tumors afterward entirely disappeared. As, however, in these cases no microscopic examination was possible, they are less instructive than they would otherwise have been. Nannotti and Baciocchi have been endeavoring to determine the influence of the operation by experiments upon dogs and rabbits, and they express the opinion, as a result of these operations, that operative interference stimulates reparative changes by the mechanical influence which it exerts on the peritoneum. We may conclude from clinical experience and from experimental evidence that the

benefit which results from surgical interference in peritoneal tuberculosis is due to the abdominal incision and the manipulation of the parts.

Thomson reminds us that all cases of peritoneal tuberculosis should not be operated upon, as there is a natural tendency to spontaneous recovery; no cases should be operated upon until medical treatment has had a fair though a not too prolonged trial. Upon the local measures in which some confidence is to be placed he mentions massage of the belly and measures calculated to restore the normal functions of the intestine. The inunction of mercury and other ointments is chiefly beneficial because of the mechanical manipulations, which stimulate the tissue activities. The securing of copious evacuations of the bowels by drugs is also to be recommended. Should these means not soon produce amelioration, operation is to be thought of. In all cases of diffuse serous or purulent ascites operation is very certain to cure; free incision is made, the fluid is evacuated. When the fluid is serous we can, if we wish, insert some iodoform into the parts exposed by the incision and close the wound by suture. The iodoform is probably of value by preventing tubercular infection of the tissues of the abdominal wall and the consequent breaking down of the scar. It is not probable that it influences the existing peritoneal tuberculosis. When the fluid is purulent—that is, when cold abscess exists—we should drain with a tube for 2 or 3 days, removing the drainage-tube when the amount of discharge is no longer sufficient to soak the dressings. To leave the drainage-tube longer may lead to the development of a sinus or by pressure may favor the formation of a fecal fistula. Operation is remarkably successful when fluid is encysted or circumscribed by adhesion. When fluid is small in quantity and when adhesions constitute a predominant feature in the case, more knowledge is required in regard to diagnosis and as to the advisability of operation. Thomson has had 5 such cases, in all of which he operated at one stage or another—in 2 for the purpose of relieving obstruction of the bowels, in the remaining 3 with the object of curing the tubercular condition. In every case the diagnosis was much aided by a rectal bimanual examination made under anesthesia, for in every case such an examination detected a large swelling in the pouch of Douglas, which consisted of a mass of adherent intestinal coils. This matting of the intestines in the pouch of Douglas is one of the evidences of tubercular peritonitis. Matting is always more marked below the umbilicus than above it, and expresses the influence of gravity in the localization of infective intraperitoneal disease. The operations for obstruction were both successful. In the 3 remaining cases of matting and adhesion the operation was performed for the cure of a tuberculosis. All were males, their respective ages being 6, 15, and 37. In the first case a median laparotomy was done below the umbilicus, and the adherent coils beneath the abdominal wound were partially separated. It was followed by satisfactory recovery. Both of the other cases were less favorable, because they presented a suspicion of tubercular disease of the lung. In both of them an attempt was made to separate the adherent coils of intestine. In both fecal fistulæ formed at a subsequent date. In both there was for a time de-

cided improvement in the general condition, but the boy died 5 weeks after operation with a large empyema, and the man died 3 weeks after operation of pulmonary tuberculosis. In these cases a drainage-tube must on no account be employed. It has been shown by irrefutable evidence that perforation of the wall of the bowel is not the result of ulceration of the mucous membrane, but the result of the breaking down of a tubercular nodule on the peritoneal or external surface of the bowel. [I. Israel says that the cure of tubercular peritonitis by operation is not due to evacuation of fluid, for he has seen cases cured when no fluid was found. Most observers think high temperature contraindicates operation, but Israel does not think so. Spencer Wells has followed some cures for 25 years. Stchegoleff says recovery is brought about by inflammation; embryonic tissue forms and active phagocytosis takes place. Jordan says the cause of cure is unknown, but unquestionably the tubercular tissue is absorbed and the peritoneum returns to a normal condition, in many cases with formation of adhesions. Cure is not considered as attained until 1 year after operation. Roesch has collected 358 cases operated upon: 20 died from the operation, 51 died in a few weeks from tubercular disease in other regions; 250, or 70%, were cured. (See Beiträge zür klinische Chirurgie, Band xii. Heft 3, 1895).]

Louis Frank[1] in an article upon **septic peritonitis** maintains that the gonococcus in its virulent state, before it has been for any length of time in the pus of a pyosalpinx, is capable of producing virulent peritonitis, and he cites a case to prove it.

HERNIA.

Golding-Bird[2] discusses **the curability of hernia.** He tells us that hernia is the objective result of multiple hidden causes, not the least of which is the patient's habit or occupation. From its surgical-therapeutic point of view there are 2 forms of inguinal hernia—the congenital and the acquired; and of the former there are two varieties: one is the strictly congenital, when the gut enters a patent tunica vaginalis; the other is due to the gut making its way into a congenitally patent tunica vaginalis through the abdominal end of its vaginal process at the inner ring. He says that a truss acts not by corking up a hole, but by flat pressure preventing the exit through an abnormal aperture of some of the abdominal contents, and thus far it is palliative. It can be curative if it brings about closure of the aperture, and it may do this in one of two ways: In the congenital hernia of infants we are dealing with a condition of delayed development. If, therefore, in the earliest months of life we so adjust a truss that the gut never protrudes, natural closure will in many cases continue and come to a successful termination. The child is then cured by a truss. In later child-life and in young adult-life there is no tendency for this normal developmental process to go on. The aperture may physically contract, because it is never allowed to be stretched, yet there the aperture is. There will always be danger when a truss is removed unless

[1] Med. News, Oct. 19, 1895.

[2] The Practitioner, Jan., 1896.

some obliterative adhesions form or some viscus, as the omentum, becomes closely adherent across the mouth of the sac. Let us suppose a young man has been advised to wear a truss for hernia; after seven years he asks if he may leave it off, as he has seen no sign of a rupture for the past five years. What proof is there that he is cured in the sense of securing permanent closure, or that he is simply temporarily relieved by a contraction of the opening into the sac? There is no proof except trial. He may be cured for good, but the chances are against this, and the risk of waiting to see by leaving off the truss is hardly compensatory. Golding-Bird then quotes Macready that 58% of cases under 12 months of age can be cured by a truss, 10% of cases between 1 year and 5, and after that practically none; and in acquired hernia the truss cures at 15 years 5%, and at 30 years 1% of cases. He therefore lays it down as a rule that except for infants under 1 year of age we need not attempt to cure by a truss, and for the bulk of patients a truss once adjusted means a truss for life. In order to cure a hernia the surgeon must put some opposition to its exit, or so alter the peritoneum that not only is the sac removed, but the funnel-like peritoneal depression is removed also. The old methods of radical cure consisted in the production of plastic inflammation about the neck of the sac, and more lately in the sewing of the stump of omentum in the neck of the sac. Both of these means are absolutely unreliable. We have learned from these procedures that it is not so much the occlusion of the passage we desire as the alteration of the face of the peritoneum, thus preventing the impulse of the gut at the same spot and leading to the obliteration of the sac. [We have had better results from the methods of Bassini and Halsted than from any other procedures. The closure should be effected with kangaroo tendon, a material which is not absorbed for 60 days.]

Schloffer[1] has made **bacteriologic examinations of hernial fluid** with reference to attacks of pneumonia complicating strangulated hernias. His conclusions were that the fluid taken from hernia in human beings was sterile. In animals bacteria were found after a period of incarceration of 7 hours, but bacteria were sometimes absent in animals even after an incarceration of several days. Fluid containing bacteria was sometimes found round a loop of intestine which was functionally active, and sterile fluid was occasionally found around a loop of intestine whose nutrition was almost destroyed. If bacteria once appeared, they progressively increased in number during the incarceration. The fluid at first is bactericidal in its properties, but this is gradually destroyed. In human beings the diplococcus of pneumonia may pass from the intestines into the fluid of the hernia, and this would prove the connection between strangulation and the pneumonia which sometimes is associated with or follows it. The author believes that such pneumonia is due to septic emboli.

How to prevent hernia after celiotomy was discussed at the Congress of Gynecologists in Vienna. Winters[2] showed that in his clinic after

[1] Beiträge z. klin. Chir., 1896, xiv. No. 3, p. 813. [2] Wien. klin. Rund., 1895, p. 569.

celiotomy he had 30% of hernias in 1889 and 23% in 1891. The prevention of these herniæ depends on securing primary union of the wound, and in suturing each layer of fascia instead of including all layers in one suture, Winters now follows this method and uses catgut sutures, and during 1884 reduced his postceliotomy hernias to 8%. He uses collodion to dress his wounds, and never employs a binder.

Bollini[1] reports an extremely interesting **case of a reducible hernia** which occurred in the left ischiorectal fossa, the hernial mass being about the size of a cocoanut. Prof. Bollini performed an operation for the relief of this condition. He placed the patient in the lithotomy-position, and made an incision parallel to the ascending ramus of the ischium. He removed the fat from the ischiorectal fossa, separated the fibers of the levator ani, and opened the peritoneum. The sac was found to contain the left tube and ovary, a portion of the sigmoid flexure, and a loop of small intestine. Catgut sutures were employed to close the wound, the tissues about the vagina and rectum and the internal obturator aponeurosis being approximated. Perfect cure was obtained.

Croly[2] upon **hernia and taxis** says that taxis should mean the methodical and the gentle manipulation of herniæ for the purpose of effecting their reduction—never forcible manipulation, by which tissues are contused and often irreparably damaged. More injury may be inflicted on the bowel in a few minutes by brute-force taxis than the constriction could produce of itself in several days. He quotes the old rule of Desault, "to think favorably of a strangulated hernia when taxis has not been used," and modifies this surgical aphorism thus: "Think favorably of a strangulated hernia when the taxis has not been abused." If there are signs of inflammation or edema, of emphysema or gangrene, or if the patient is in collapse, never employ taxis. If the tumor is very tense, especially in the femoral region, the less taxis the better. Croly's own practice has for many years been as follows: Having satisfied himself that the case is one of strangulation, he has the bladder emptied and an enema administered by means of a long tube. He has the patient anesthetized and all instruments and appliances ready for operation. In the suitable cases he gives the taxis a fair trial, having the parts relaxed by proper position, and, if no impression can be made on the tumor, proceeds at once to operate. He ventures to try the taxis longer in an inguinal hernia than in a femoral hernia. He has seen the intestine in a femoral hernia burst by the efforts of a patient to reduce it. He has seen a femoral hernia reduced en masse by taxis with inversion of the body. Dangerous as taxis is in unskilled hands, it is often the cause of death in experienced hands by the dangerous delay in operating. We commend the rest of this article to the attention of the reader.

Two very remarkable cases of **obturator hernia,** one of which was bilateral, are reported by Anderson,[3] who says that this is one of the rarest of sur-

[1] La Clin. Chir., Aug., 1895. [2] Dublin J. M. S., July 1, 1895.

[3] Lancet, Apr. 4, 1896.

gical maladies. Only 30 operations have been known to be performed for this condition in Europe down to the present time. Case 1 is the only example reported of bilateral obturator hernia treated by operation. Case 2 shows the disastrous consequences of delay in calling for the surgeon's aid in obscure conditions of intestinal obstruction. Case 1 was a woman of 70 years of age. She had suffered for the last 7 years from occasional attacks of intestinal obstruction, accompanied by pain on the inner side of the left thigh and some fulness in Scarpa's triangle. The symptoms always disappeared in the course of a day or two and left no ill effect.

In a discussion on **the treatment of hernia in children**[1] Rushton Parker said that there is presumed to be the employment of a truss in the first instance, and in not a few instances the hernia entirely disappears. Phimosis by the straining which it occasions is thought sometimes to be contributory to hernia, and this condition should always be relieved by circumcision when the truss is used. If we perform a radical cure and phimosis exists, we should circumcise at the same time or shortly afterward. The recent improvements in the operation for radical cure have led us to a certain extent to relax efforts with trusses. Parker, however, still maintains that when a truss satisfactorily keeps up a hernia no surgical interference is necessary, and there is no doubt that well-trussed herniæ in children have a strong tendency to become cured. Parker has operated on 40 cases by the radical cure, and there have been only 2 failures. The operation in children is easier than it is in adults in most cases, but occasionally it is rendered difficult by the small size of the parts concerned and by the close attachment of the sac. As a rule, the sac should be opened. No object is served in refraining from opening it. Ligature of the neck of the sac often brings about a cure, but Parker believes that Macewen's method is the most rational and secure. In the case of infants in arms the patient is kept under observation until healing is accomplished, which is about a week or so. In older cases the patient is kept in bed for several weeks to ensure a firm resisting scar. Macewen has advised a period of recumbency of 6 weeks in adult operations. In active children of from 6 to 12 the same rule should be enforced, while in younger children yet in arms it is carried out, though to a less prolonged extent. In double hernia we may do both the operations the same day. In the discussion which followed, Mr. Lockwood said that he avoided operations in infants because they might be cured by trusses and because there were certain anatomical difficulties and dangers. It is always difficult to separate the sac from the spermatic cord without injuring the cord. The operation for inguinal hernia in little girls was very easy. At first Lockwood used to do Macewen's operation; now he opens the canal boldly, in order to be sure that he has stripped up the sac as far as the internal ring. In regard to the allegation that the aponeurosis of the external oblique is not a firm support, he had never met with a case of failure from this cause. He employed twisted silk as a suture material. Mr. Langdon said that he had never yet met with

[1] Brit. Med. Jour., Sept. 21, 1895.

a child who could not wear a truss. If it was not comfortable, the fault lay with those who adjusted the truss. In 100 cases in private practice 47 were cured during the first 3 years, and there were only 8 in which treatment by truss was not satisfactory. Cases of hydrocele were not suitable for treatment by truss. Adherent omentum with fluid necessitates operation. Large herniæ, even when well kept up by a truss, may occasion so much discomfort as to demand operation. Macewen said that treatment by a truss, however possible in private practice, was impracticable among hospital out-patients. He had operated upon some 20 or 30 children in which there had been great difficulty in keeping up the sac by a truss. He admitted that there was some difficulty in separating the cord from the sac, and also that the conjoined tendon was thin, but these tissues, though delicate in children, were reliable and better to depend on than cicatrix. He also uses catgut, and claims that it remains unabsorbed for 2 or 3 weeks. He never uses drainage and never had suppuration. Cousins said that he preferred to operate at the age of 1 year or over, provided the child was in good health and every exciting cause had been removed. He seldom operated on children under 1 year. Some cases are cured by careful truss-treatment, but many parents among the poorer classes cannot carry it out, and a few cases are quite unsuitable because of the size of the protrusion or the difficulty of keeping it up. He believed in all congenital herniæ the sac should be completely divided—that we should form a new tunica vaginalis and secure the sac firmly within the canal. Since 1890 he had performed 90 operations. Three had died—1 from scarlet fever, 1 from measles and bronchitis, 1 from acute septicemia contracted by careless nursing; but the other cases had been completely successful. He always employs a specially trained nurse, and carefully covers the seat of operation with india-rubber traction, and insists upon rest after the operation in the recumbent posture for some weeks.

Macready said that the proper classification of hernias was into those controllable by trusses and those uncontrollable. If we extend the practice of operation to include controllable cases, we may obtain flattering results, but overstep the bounds of necessity. Many cases are cured spontaneously or by trusses. The danger of strangulation in childhood is infinitesimal. He prefers to postpone operation at any rate until after puberty. Southam said that when we treat a patient by a truss we should carefully regulate the diet. In infants under 9 months old a Berlin wool truss is sufficient. After the child begins to walk a strong truss is the best. After a fair trial of a truss, and when there is no tendency to spontaneous cure, we should operate. Symonds said he only operated when truss-treatment failed. He employed Macewen's operation, and used catgut sutures and drained for 48 hours. Lucy agreed that diet was an important consideration—that all straining should be prevented, that phimosis should be treated by circumcision, and that any congenital smallness of the meatus should be corrected. Harrisson claimed that the simpler the operation the better, and, as children's tissues stand sutures badly, the minimum quantity will do. Waterhouse was surprised at the way every

speaker had excluded strangulation. He had himself operated 4 times for strangulated hernia in children under 2 years of age, and had assisted in 2 or 3 others. He employs Macewen's operation and the recumbent position for 6 weeks for even young children. Morgan said that in recent years he had seen a great many cases of strangulated hernia in children. He preferred to do a radical cure when the child was more than a year old, because of the difficulty in separating the sac from surrounding parts. He found that none of the suture-material in general use was quite satisfactory. Parker in replying said that the green sulphurized and chromicized catgut was perfectly satisfactory for sutures. It is strong and takes several weeks to absorb. He never uses the common yellow catgut except for the skin. With regard to recumbency, he considers infants in arms sufficiently recumbent. Older children should be kept for some time in bed after the operation. He thought it better not to open the inguinal canal. He generally, though not always, sutured the pillars of the ring, and agreed with Cousins that in children even an imperfect operation often succeeds.

Brown[1] has reported **a case of strangulated hernia** in the right inguinal region in a child 2 months old. Inversion and taxis under chloroform failed to bring about reduction. The index finger of the right hand was introduced into the rectum and steady pressure was made on the mass externally with the left hand. With the finger in the bowel he pushed the part of the mass which could be felt through the abdominal opening from side to side. By this maneuver the mass was moved back through the opening and finally dropped back into the abdomen, when he found that the tip of the finger could then be inserted into the internal ring. He suggests that a surgeon with a small hand might introduce the hand into the rectum and carry out this maneuver in adults.

Henggeler[2] gives a study of the **statistical results** of 276 cases of strangulated hernia. There were 64 deaths, with a mortality of 23.2%. He excludes 3 deaths in cases not operated upon, 13 in which it was necessary to make an artificial anus, 8 in which resection of the intestine was necessary, and 7 others in which the conditions were very complicated. These exclusions left a mortality of 15.5% for the ordinary operation of strangulated hernia.

Rose[3] showed **2 unusual cases of hernia.** In 1 there was an irreducible femoral epiplocele which became strangulated, and when seen and admitted gangrene of the hernial contents and adjacent skin was present with marked toxemic symptoms. There was a large black slough protruding through an oval aperture in the skin about 2 in. in diameter, and it had the characteristic appearance of dead omentum. There was no escape of feces and no general abdominal distention or tenderness. The wound was dusted with iodoform and charcoal poultices were applied. The bowels were not opened until the third day. The slough separated, the wound healed, and the patient made a thorough recovery. [Dr. Hearn recently attended a similar case in

[1] Med. News, May 4, 1895.

[2] Beiträge z. klin. Chir., xv., No. 1, p. 1.

[3] Lancet, June 20, 1896.

the Jefferson College Hospital.] The other case showed that a chronic process of inflammation had been going on for years between the sac-wall of a femoral hernia and the reducible portion of omentum surrounding a prolapsed varicocele, leading finally to a complete shutting off of these structures from the peritoneal cavity. Mr. Rose on operating found a great mass of sclerosed omentum. It was completely shut off from the general peritoneal cavity, and running through the center of it was the appendix; this and a mass of omentum were removed on a level with the femoral opening and the wound healed in a few days.

Lockwood[1] considered the operation for **strangulated inguinal hernia** in relation to recent advances in surgery. The operation which he performs differs in many ways from that which used to be done. It is simply the operation for the radical cure of inguinal hernia, but differs from Ferguson's old operation. The objects aimed at are not only to relieve the strangulation, but also to cure the hernia. No special instruments are needed except a pair of curved blunt needles for transfixing the sac or omentum and for restoring the inguinal canal. The other instruments are such as would be ordinarily necessary in a hernia operation, although a director and hernia knife are not required, because the neck of the sac is divided from the outside. When the operation for strangulated umbilical hernia is done the same instruments are necessary. A broad-grooved director and herniotomy knife are still necessary for the operation upon strangulated femoral hernia.

Robson[2] describes a case of **enormous hernia treated by operation.** The man stood 6 ft. and the tumor reached to his knees. He was 62 years of age and had emphysema and a winter-cough. The left hernia was first operated on. The greatest difficulties consisted in returning the contents of the sac. It seemed to contain a great part of the intestines, and it was necessary to remove a large amount of omentum. It was impossible to encircle the neck of the sac with one ligature, and it was treated with interrupted sutures as in closing the incision of the ordinary celiotomy. The aponeurotic and muscular layers were then sutured separately—the latter by ordinary interrupted silk sutures, the former so as to bring surfaces of the aponeurotic surfaces together. The skin was sutured by silkworm gut, and a large cavity in the cord was drained. Healing took place, and in October he had the other side operated on. The herniæ were completely relieved. It is probable that in the future such large herniæ will rarely be seen, since ruptures which cannot be restrained by truss will be operated upon at an earlier period. The method Robson usually follows is to lay open the inguinal canal to ligate the neck of the sac, and to excise the sac $\frac{1}{2}$ in. below the ligature. In order to carry the pedicle inside the abdominal muscles he leaves the ends of the encircling ligature long, threads them on curved needles, carries them behind the transversalis fascia, makes them pierce the whole thickness of the abdominal wall, and thus leaves no pouch opposite the internal ring. The layers of the abdominal wall are sewn up separately, the cord is freed as in Bassini's or

[1] Lancet, Mar. 28, 1896.

[2] The Practitioner, Oct., 1895.

Halsted's operation, and if there is redundancy of the spermatic veins they are excised. Drainage is only employed where a large cavity is left. The patient rests for about a month, and no truss need subsequently be worn.

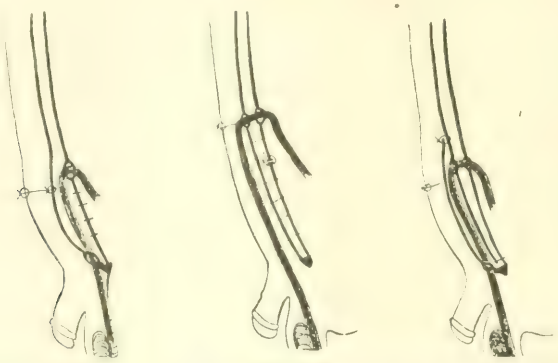


FIG. 38.—Schematic representation of anterior abdominal wall in anterior posterior section, showing 3 methods of disposal of the cord (Andrews, in Chicago Med. Recorder, Aug., 1895).

Imbrication or lap-joint method, a plastic operation for hernia, is the title of an article by Edward Wyllys Andrews[1] of Chicago. He advocates the overlapping the several aponeurotic layers of the abdominal wall. The present paper deals with inguinal hernia. He uses this method to supplement and reinforce existing methods. The principle is the outgrowth of clinical experience rather than theory. Every operator who has done many Bassini operations will corroborate the statement that occasionally quite an undesirable degree of tension comes upon the deep sutures. It is often difficult to close the internal ring without dragging upon Poupart's ligament. In very large rings there is such an absence of conjoined tendon on the inner and upper margin that instead of finding good aponeurosis or muscle to stitch to, we find that we must go quite to the sheath of the rectus. The appended cuts will exhibit the principles of this operation (Figs. 38–41).

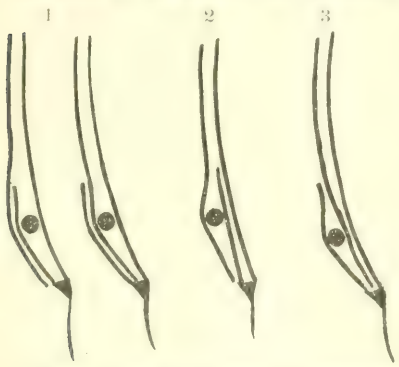


FIG. 39.—Diagram of 3 possible methods of imbricating the layers of the abdominal wall (Andrews, in Chicago Med. Recorder, Aug., 1895).

Coley[2] writes on **the Disadvantages of Nonabsorbable Sutures** in Operations for the Radical Cure of Hernia. In 1893, in a paper written by Dr. Bull and himself, the statement was made that we should discard all methods in which foreign bodies, even though aseptic silk and silver wire, were buried in the wound of a hernia-operation. Since that time there is an accumulated mass of clinical evidence in support of this view. Coley has added 14 observations in which, when these sutures were used, sinuses subse-

[1] Chicago Med. Recorder, Aug., 1895.

[2] N. Y. Med. Jour., Feb. 29, 1896.

quently formed and relapse of the hernia took place. In 250 operations in which he has used kangaroo tendon for buried suture he has not found a single case of sinus formation, and has had 96% of primary unions. When a sinus does form after using nonabsorbable sutures, it is the least of the evils, for in nearly all reported cases the suppuration so weakens the tissues

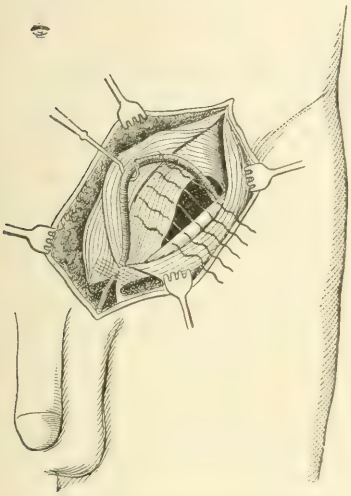


FIG. 40.—Bassini's operation, showing deep sutures ready for tying to repair internal ring (Andrews, in Chicago Med. Recorder, Aug., 1895).

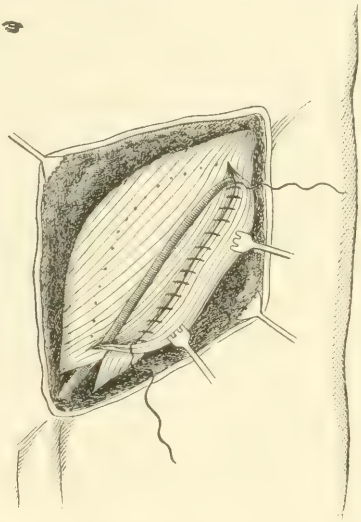


FIG. 41.—Imbrication operation, showing how the deep sutures draw upper flap of external oblique down to Poupart's ligament. The lower flap shown retracted will be replaced over cord to the dotted line (Andrews, in Chicago Med. Recorder, Aug., 1895).

that relapse follows. Every abdominal surgeon knows that silk sutures, even if buried within the abdominal cavity, frequently find their way out. The presence of sutures in the hernial canal after firm union results in harm and not in benefit, for even the firm tendinous structures that make up the walls of the hernial canal require no more than 8 or 10 weeks for firm union. The ideal suture is one which would hold the parts in apposition for this length of time and then be absorbed. The kangaroo tendon fulfils these conditions. Unless those who use and advocate silkworm gut or silver wire in hernia operations are able to present some advantages to offset the serious disadvantages that have been demonstrated, nonabsorbable sutures should be entirely abandoned. [We are in entire accord with Coley in his contention.]

Brewer[1] makes a report on the condition of the parts found upon autopsy 6 weeks after **Bassini's operation** for hernia. The patient had been stricken with apoplexy 5 weeks after operation, and died 7 days after his apoplectic seizure.

"The skin and subcutaneous areolar tissue were found to be moderately adherent to the aponeurosis of the external oblique muscle. The divided aponeurosis had firmly united throughout. At the upper extremity of the wound a portion of the fine silkworm

[1] Am. Med. Surg. Bull., Feb. 29, 1896.

gut was seen imbedded in the tissues in an apparently aseptic condition. The floor of the inguinal canal was found to be firm. The arched border of the internal oblique and transversalis muscles apparently united with Poupart's ligament. Between the aponeurosis of the external oblique and the floor of the canal the vas deferens, spermatic artery, and a number of veins could be seen, apparently healthy and lying separately. These were traced upward through the artificially made internal ring and downward into the scrotum, becoming more united and apparently bound together as they approached the testicle. None of the kangaroo-tendon sutures could be found, although several small tendinous shreds were imbedded in the tissues."

De Garmo [1] furnishes a note upon **the surgical cure of hernia.** He says that we occasionally find in the canal when we perform Bassini's operation substances that must be removed, and which if left behind will strongly predispose to relapse. These substances are tough and thick sacs, constituting a noncollapsible serous tube connected with the cord, extraperitoneal lipomata, enlarged veins connected with the cord, and masses of adherent omentum. He states that any method of operation which fails to remove all abnormal tissue will be a failure. He holds that suture material shall not be such as will readily absorb, that the mortality is a fraction of 1%, and that the time of confinement to bed should be but 8 or 10 days. The percentage of permanent cures is about 90. [If we want a permanent cure, we should keep a patient in bed for 4 weeks after operation. What we must get is a tendinous union, and we cannot get this solidly in less time.]

Cabot [2] says in regard to the operations for the **cure of inguinal and femoral hernia** that we should make a new canal, running upward and outward, so that the downward pressure of the bowels coming at right angles to the axis of the canal would tend to force its walls together. We may accomplish this by keeping the external oblique aponeurosis well up toward the anterior superior iliac spine, as in Bassini's operation, cutting off the sac on a level with the surface of the peritoneum, then suturing the internal oblique and transversalis fascia on the inner side and Poupart's ligament on the outer side, which sutures include the edges of the slit in the external oblique aponeurosis, thus closing the old inguinal canal. The upper portion of the cut in the external oblique aponeurosis is closed with a continuous buried suture, which also includes the upper edge of Poupart's ligament. The spermatic cord is brought through at the highest point of this opening. The radical cure of a femoral hernia is rendered difficult because of the shortness of the femoral canal and the close proximity of the femoral vein, and because the canal is made up of dense tendinous structures. The stitches when applied create a great deal of tension. Cabot advises that a semicircular incision should be made through the fascia lata just beneath the saphenous opening, after the saphenous vein has been tied and cut away. The fascia can then be thoroughly separated, so that the lower wall of the femoral ring may be drawn upward, held with sutures without the least tension, and the whole canal tightly closed with ease.

[1] Jour. Am. Med. Assoc., xxv. No. 2, p. 53, 1896.

[2] Boston M. and S. Jour., cxxxiii. No. 21, 1896, p. 510.

APPENDICITIS.

Deaver[1] in **"Some Salient Points in the Diagnosis, Pathology, and Treatment of Appendicitis"** maintains emphatically that **early operation** is the only justifiable procedure and the only method of obtaining a certain way to recovery. He has operated upon 200 cases with only 2 deaths, and these in the first 100. He says there are 3 symptoms which cannot be mistaken: sudden onset of acute pain in the abdomen, which may or may not be accompanied by vomiting; rigid muscles on the right side of the abdominal wall; and tenderness in the appendix-region. Typhoid fever should not be mistaken for appendicitis. The former has a slow onset, no abdominal rigidity; if there is any abdominal tenderness, it is where the spleen is enlarged; the patient is very weak. There are headache, nosebleed, and characteristic temperature, whereas in appendicitis the surgeon feels a tender mass by rectal examination. Appendicitis could never be confounded with pelvic suppuration if early operation were always carried out. Abscess of the ovary and pyosalpinx are always associated with a record of an antecedent vaginal infection, and we find in Douglas' culdesac a mass of inflammatory material which is attached to the uterus, and which anchors this organ more or less firmly, and which may be distinctly outlined by vaginal or combined vaginal and rectal examination. In pus-affections of the kidney or ureter we do not find the cardinal signs of appendicitis which have been mentioned. An appendicitis-pain is occasionally referred to the left side of the abdomen, and in these cases it is extremely important to find out if there is an abscess in this region, and we find out by means of a rectal or vaginal examination. Deaver believes in removing the appendix even in pus cases. [The next article ably discusses the propriety of always removing the appendix.]

White[2] inquires if **the appendix should be removed in every case of appendicular abscess.** He tells us that the true mortality of early operation in cases in which appendicitis is present, as distinguished from cases in which it is only **diagnosticated;** the true mortality of the operation of removing the chronically diseased appendix in the interval between attacks, as distinguished from the mortality of removal of a normal appendix; the percentage of ventral hernias, peritoneal bands, and other sequelæ; the existence or non-existence of catarrhal appendicitis and of stercoral typhlitis; the alleged infective character of all appendicular inflammations; the proportion of second attacks after one mild attack, and the proportion of these which may be avoided by dietetic care; the value of appendix-bacteriology; endless minor differences as to the seat and character of the wound; the treatment of the same, etc.,—all these are problems not only awaiting solution, but questions many of which have two sides worthy of respectful consideration, and a final conclusion satisfying in every respect is to-day logically impossible. There are other points as to which White thought other surgeons were well agreed. He believed that few would dissent from the following rules: Immediate ope-

[1] Med. News, Dec. 21, 1895.

[2] Univ. Med. Mag., Mar., 1896.

ration when the onset of the case is marked by suddenness and severity, and whenever, even in a mild attack, the symptoms at the end of 48 hours are found unimproved or worse; whenever in cases seen later a firm, slow-forming, well-defined mass is felt in the right iliac fossa; whenever at any time there is a sudden increase in the acuteness of pain and a rapid diffusion of tenderness; whenever the appendix-infection is believed to be tubercular; whenever attacks of any type have been numerous or are increasing either in number or gravity, or have unfitted the patient for work or activity, or have caused local symptoms which are permanent or persistent or have at any time put the patient's life in great danger. Other questions there are to which the same assertion does not apply, and one of these has always been a source of grave anxiety to many operators. A short time ago White summarized his own view in regard to it by saying that it must be determined by future experience whether cases seen from the third to the sixth day, which present indications of a beginning circumscription of the disease by adhesions, and which tend to the formation of local abscess, will do better with immediate operation with the risk of infecting the peritoneal cavity, or with later operation when the abscess-wall is stronger and less likely to be broken through. This is the time which Richardson has described as "too late for an early operation and too early for a safe late operation;" and this distinguished surgeon has further stated that there is no more difficult operation in surgery than that of removing the appendix at this stage without infecting the general peritoneal cavity. White thought that his view in regard to this point was identical with that of every surgeon competent to pass upon it, and it was recently formulated as follows: "If there is a circumscribed abscess, it is poor surgery to insist in every case and at every period upon finding and attacking every appendix in the face of all obstacles. In many cases of circumscribed abscess, especially in those in which the appendix is bound down by adhesions in the depth of the wound, the surgeon should be content with evacuation, irrigation, drainage, and packing with iodoform gauze. Persistent search for the appendix and attempts at its removal in these cases are attended with such danger of opening the peritoneal cavity that they are not to be recommended."

Dr. White has seen a recent article in which statements are put forth diametrically opposed to these, and in which it is maintained that it is always advisable to remove the appendix in every case. This article led him to a serious consideration of the matter, with the result that his confidence in his original opinion was increased. The assumption that to leave an appendix which has sloughed or has been perforated or has been the seat of infectious inflammation, means the certainty of fecal fistula or of subsequent acute attacks, was positively contraindicated by his own experience and by that of the profession. He has operated and left the appendix in 37 cases of circumscribed abscess. In 2 of them a fecal fistula formed and closed spontaneously and permanently. In the third, still under treatment, it had become obliterated. The fact that White had no mortality in these cases justifies him in doubting the reliability of the other observer's sweeping assertions. These

assertions are further contradicted by current surgical literature, notably in the observations of Treves, Fowler, and Richardson. White asked for an expression of opinion from McBurney, Bull, Senn, Halsted, and Richardson. McBurney says that there are certainly some cases, and not a few, in which the appendix is so deeply imbedded in the wall of the abscess that to insist upon its removal would be to incur unjustifiable risks. Attempts at removal often mean great prolongation of the operation under unfavorable circumstances, and such danger of infecting fresh peritoneal surface that one had best be content to leave the appendix or its remnant to be disposed of by obliteration in wound-healing or by its removal at a more favorable time through a second operation. Bull does not believe that it is always advisable to make the operation a complete one. He searches for and removes the appendix when it can be readily found and separated from adhesions; and this is, as a rule, feasible in cases operated upon up to the 7th day. In cases operated on at a later date or those in which the abscess is rather large, distinctly circumscribed, and with firm walls, he does not attempt to remove the appendix. Senn regards a persistent search for the appendix in such cases as extremely hazardous, as it often results in fatal septic peritonitis. Halsted says that he does not remove the appendix in every case of appendicitis. If there is only one abscess, and it can be evacuated without entering the uninvolved part of the peritoneal cavity, he treats it simply by incision and drainage. Richardson supports White's position strongly, and believes that a man is better off living with an appendix at the bottom of an obliterated pus-cavity than dead with a beautiful specimen in a bottle on the surgeon's table. In conclusion White says that we should aim first at the recovery of the patient, and only secondarily at the performance of a theoretically complete operation. [We are in cordial agreement with Prof. White in all of his assertions upon that point. We believe, and most emphatically, that the rule of invariably removing the appendix is a bad one, and must inevitably cause some deaths which could be prevented. Dogmatic assertion may be an easy way for a surgeon to escape from difficult problems, but it is hard upon the patient, who must bear the brunt. Facts are stubborn things, and the most absolute dogmatism cannot lessen their force. White's view is cautious, scientific, and, we believe, correct.]

Meyer[1] says operation must be done at once in diffuse perforative appendicitis. In case of acute appendicitis the patient must be carefully observed, and a pulse which rises above 116 to 120 is an indication for operation. In cases of doubt we should operate. A case of mild appendicitis also, after the first severe attack from which the patient recovers without immediate operation, the appendix should be removed, as if left alone it will be likely subsequently to cause serious and even fatal trouble. In these interval-operations we may separate the abdominal muscles according to the direction of their fibers, and thus protect the patient from the danger of a ventral hernia. [The exact time for operation and the suitable case for operation cannot as yet be always determined with absolute certainty. Each case must be studied and treated upon

[1] N. Y. Med. Rec., Feb. 29, 1896.

its own indications. The question is of cases rather than of classes. Every conscientious surgeon must often be in doubt. Simply because it is easy to say operate on every case does not always make it right to do so.]

McGuire[1] as regards **relapsing appendicitis** cited 17 cases treated by operation, and strongly opposed any routine operation in an acute attack. He states that he is not always in a great hurry to operate, but is inclined to wait for the more acute symptoms to wear off, and to operate, if at all, after suppuration has taken place or in the interval between attacks. Cabot[2] maintains the necessity of removing the appendix in relapsing appendicitis. He states that the operation done between attacks, when the tissues are comparatively healthy and not already filled with microorganisms, is free from many of the dangers which surround an acute attack, and its mortality is comparatively trifling. Bull's statistics put the mortality at about 3%. His personal experience comprises 32 operations, without a death. Murphy[3] has operated upon 207 cases of appendicitis with a mortality of a little less than 10%, and he operates on every case that comes under his notice, and strongly maintains the necessity of such a procedure. [Greig Smith, in discussing the question of operation when mild appendicitis exists, says: "It is impossible to be definite and wrong to be dogmatic"—a comment which we will insert in this place.]

Page[4] presented the records of some cases illustrating the diseases in the **surgery of the vermiform appendix.** One was an acute abscess from perforation in which he drained the abscess; one was an acute suppuration from perforation with symptoms simulating general peritonitis, in which recovery was obtained; the third was a very remarkable case in which an acute abscess arose from a perforated appendix, with symptoms suggestive of a perforative ulcer of the stomach. A median celiotomy was done, nothing was found, and the patient died. One was a case of operation for recurrent attacks of appendicular colic with recovery, and a fifth case was of the same description. Page, speaking of Case 3, says that it was one of the most deplorable cases he ever had to deal with. The diagnosis of perforation of the stomach having been made, it would have been difficult for any surgeon not to act upon it, especially as the tympanitic distention seemed to point to air in the perineal cavity. He says had he followed his own rule, unfettered by any previous diagnosis, he is satisfied that the iliac resistance would have led him to open the abdomen, and he now regrets that he did not explore this region as soon as the opening in the middle had failed to discover the cause of the supposed symptoms. The case powerfully illustrates the manner in which a local, acute, and circumscribed abscess from appendix-perforation may simulate a general peritonitis from an entirely different cause. The appendix should never be forgotten in all cases of the kind.

Morris[5] reports a series of 100 consecutive operations for appendicitis. All of the acute-abscess cases were operated upon at once, with the exception of 2,

[1] Med. News, Nov. 23, 1895.
[2] Boston M. and S. Jour., Dec. 26, 1895.
[3] Jour. Am. Med. Assoc., Mar. 30, 1896.
[4] Lancet, Mar. 7, 1896.
[5] Am. Med.-Surg. Bull., Feb. 22, 1896.

who died before he arrived at their homes. Of the 38 abscess-cases, 36 recovered and 2 died; 1 died from suppurative nephritis, the other from septic peritonitis. The appendices were removed in all but 5 of the acute cases. He advocates a very small incision. In the cases of appendicitis after a small incision he cleans abscess-cavities with hydrogen dioxid and normal salt-solution, drains with a capillary wick, and separately sutures the abdominal layers. He opposes the use of gauze-packing for drainage, and disapproves of counter-openings. He does not use opium after operations. The reason he has no ventral hernias is because he sutures the abdominal walls accurately, and in suitable cases also sutures the cecum and the margins of the abdominal wound. In cases of acute and chronic appendicitis without abscess he operates through a $1\frac{1}{2}$ in. incision. His results are shown in the appended table:

Classification of Cases.

"Acute appendicitis, with abscess	34
Chronic appendicitis, with chronic abscess	4
Acute appendicitis, without abscess	12
Chronic appendicitis, without abscess	40
Tuberculosis of appendix	6
Cancer of appendix	1
Appendix obstructed by torsion	2
Uninfected appendix, with concretion	1
Total	100
Deaths	2
Post-operative hernia	0
Males	76
Females	24"

[The small incision in many cases we believe to be unsafe, for the surgeon who operates through a very small incision is liable to seriously injure the viscera. Morris does not make counteropenings, but in cases of general septic peritonitis thorough cleansing is impossible unless a counteropening is made. The fact that iodoform-gauze does not drain pus well is undoubted, and we question if the capillary drain will do so any better.]

Morris[1] presents another article called forth by criticisms on his statistics and methods. He calls this article "Committing Taxidermy upon Appendicitis Patients." He states that gauze-packing in the peritoneal cavity depresses the patient, often keeps him in a condition of shock, obstructs the bowel, stimulates the peritoneum to throw out great quantities of decomposable lymph, and irritates the bladder and ureter. If iodoform-gauze is used, iodoform-poisoning will often supervene, coming on sometimes insidiously and being frequently unrecognized, the surgeon merely noting that the patient's pulse is rapid and weak. [An iodoform-gauze which does not cause poisoning is spoken of on p. 206.] The removal of the gauze occasions great pain, and the large opening maintained by the gauze frequently becomes the seat of ventral hernia. There is another thing that gauze-packing does not do, and that

[1] Am. Med.-Surg. Bull., May 9, 1896.

is drain. The lymph fills its meshes and coagulates and prevents drainage. Morris opposes large incisions, advocates the use of hydrogen dioxid and saline solutions, and strongly maintains the value of early operation. He differentiates catarrhal colitis with involvement of the appendix from infective appendicitis. He does not operate upon the former class of cases, but operates upon nearly every case of real infective appendicitis, no matter what stage it presents. He tells us that by these methods of treatment we can reduce the death-rate of infective appendicitis to a fraction of 1%. Nevertheless, medical treatment is still employed with its death-rate of 10% in attacks and 30% in cases. [Iodoform-gauze is not entirely satisfactory, but we would fear to do without it in many cases, especially when it is desirable to circumscribe an infected area from the peritoneal cavity.]

Allis[1] advocates in certain cases **drainage through the rectum** in pelvic abscess due to appendicitis. He cites 3 cases, and says that he first hesitated to drain into the rectum, fearing that a permanent fistula would result from the passage of fecal matter from the bowel into the abscess-cavity, but all 3 of his cases did well, and healed earlier than many did when drained at the least dependent point.

Robinson[2] made a study of the appendix and cecum in 128 adult post-mortems. The bodies were taken just as they came, consecutively, absolutely without selection. The examinations were conducted by first examining the condition and position of the great omentum and its relation to the ceco-appendicular apparatus; the appendix was carefully observed as regards its longitudinal position and pathologic condition; the cecum was noted in relation to its anatomy and pathology. He assumed as the standard of reference for the ceco-appendicular apparatus the psoas and iliac muscles; 72% of peritonitis occurs in adults around the ceco-appendicular apparatus; hence he terms this region the major region of peritonitis, the other three major regions being the pelvis, gall-bladder, and mesosigmoid. It seems to Robinson very evident that the factor which induces 72% of peritoneum-adhesions around the ceco-appendicular apparatus is the psoas muscle, and that the frequency of appendicitis in men over women may be looked for in the activity of the psoas muscle on the appendix. The appendix in men is more frequently in contact with the psoas muscle than in women, and in the relation of the motion of the psoas muscle and the condition of the appendicular contents the position of the wall are etiologic factors in appendicitis.

DISEASES OF THE INTESTINES.

Thompson[3] reports 2 cases in which **perforation of the intestine** resulted from typhoid fever. In neither of these cases was the diagnosis of typhoid fever suspected. The first patient was a walking-case who was suddenly seized with severe abdominal pain and vomiting. Four days later there was enormous distention of the abdomen, with pain, hiccough, and vomiting.

[1] Ann. of Surg., Mar., 1896.

[2] Med. Rec., Nov. 30, 1895.

[3] Med. Chron., Sept., 1895.

Celiotomy was performed, and a large amount of partly purulent fluid ran out, and near the cecum a large collection of fluid was found, which fluid was feculent and contained masses of lymph. The great distention of the intestines prevented a thorough examination of the abdomen. One of the distended coils was punctured with a large trocar and cannula, and about 2 quarts of fecal matter removed. The opening was immediately closed. In conducting the examination of the intestines a perforation of the ileum was found about 12 inches from the ileocecal valve. The perforation was oval, $\frac{1}{4}$ in. long and $\frac{1}{8}$ in. wide; the edges were clean cut, grayish, and surrounded by a zone of intense inflammation. This opening was closed with 3 interrupted sutures passed through the edges of the ulcer, and the serous coat brought together by a continuous silk suture. The abdominal cavity was irrigated and a drainage-tube was inserted. The patient died in a few hours. Autopsy proved the existence of typhoid fever. The second patient had been feeling ill for a couple of weeks. There were distention of the abdomen and a weak and rapid pulse. Opening the abdomen permitted the escape of gas and fluid. Thompson found a perforation in the cecum. The gut was so disorganized that an artificial anus was made. The patient died in 8 hours, and the autopsy proved the existence of typhoid fever. [Most perforations occur in the ileum, but they may take place in the colon or cecum. Abbé has shown that excision of a portion of the bowel is rarely necessary, inversion of the ulcerated area being all that is necessary (see *Year-Book*, 1896). A median incision is certainly best, and drainage is advisable.]

Wiggin[1] in an article dealing with the **operative treatment of perforation in enteric fever** tells us that Dr. Bontecou of Troy was the first person in the United States to operate for this form of perforation, and that this surgeon had claimed that when such a mortal accident happens celiotomy cannot impair the patient's chances, and may improve them. Dr. Van Hook reported the first successful case, and said: "It is strange that a question involving the only promise of help for $5\frac{7}{10}\%$ of all those dying of typhoid fever should not have excited even more interest and discussion." Dr. Abbe in the report of a recent successful case said: "Why one class of cases should be left to die, while we operate on all appendicitis cases when perforation can be recognized, does not appear." Prof. Kussmaul of Strasburg said: "Granted that the chance of a successful issue is heavily against you, that the patient is in the midst or at the end of a long sickness, that his tissues are in the worst state to stand the injuries of the surgeon's knife, that the lesions of the gut may be extensive, that the vital forces are at the lowest ebb, operation should be done. No one yet has hesitated to perform tracheotomy in the laryngeal complications of enteric fever which required it to save life, for these reasons." Wiggin says there are 24 cases on record with 6 recovered. If those cases are rejected in which the diagnosis is somewhat doubtful, there are 17 patients with 3 recoveries. The first recovery was obtained by Van Hook, the second by Netschajaus of St. Petersburg, the third by Dr. Abbe of New York. The

[1] Med. Press, Jan. 1, 1896.

writer's opinion is that when the physician takes charge of a case of enteric fever he should prepare himself to act with promptitude upon the occurrence of perforation. It is well to remember that while there should be the least delay possible, these patients rarely die in the first stages of collapse, and that this condition is not favorable for operation. As soon as the diagnosis of perforation is made the patient should be stimulated by strychnin and morphin. If he rallies, the operation should be performed without loss of time. If the patient does not rally, operation would be useless. Dr. Abbe has said that he considers it essential that the surgeon should never be so hasty in getting at his work that he enters upon it handicapped by poor assistants, poor light, or poor arrangements for irrigation. The arrangements for the operation should be made while the patient is being stimulated. Patients of this class do not bear anesthesia well. The writer prefers to use a closed inhaler of the Clover type or Dawbarn's modification.

[Dr. James C. Wilson was the first person to recommend operation in these cases (see Phil. Med. Times, Dec. 11, 1886). Morton, according to Greig Smith, recorded 2 operations in 1886. In the vast majority of cases operation holds out no hope, and it is unquestionable that occasionally recovery follows perforation when no operation is done. Prof. DaCosta used to speak in his lectures of such a case. We believe that operation is justifiable when the perforation is undoubted and when the patient reacts from the first depression. If he does not react, we must not operate. Even under the most favorable circumstances operation holds out a very slender hope, but it is our duty in most cases to grasp at this hope; and this is especially true in walking cases. The danger of the operation is made evident by the statement of Greig Smith, that out of 25 operations only 1 person recovered. The same distinguished surgeon says that of these 25 cases only 1 was certainly typhoid. Van Hook's article upon this subject is extremely valuable. (See Med. News, Nov. 21, 1891.)]

Hotchkiss[1] reports a case in which perforation occurred on the 15th day of typhoid fever. Operation was performed and the patient died in 4½ hours after the operation. In spite of this fatal result, Hotchkiss believes that our only hope lies in an early operation. In the case reported 10 or 12 hours had elapsed since the perforation had occurred, and a general septic peritonitis had already intervened. He thinks the operation should be classed with tracheotomy for laryngeal stenosis, and with herniotomy for the relief of strangulation, as an occasional life-saving procedure.

Warren[2] describes a case of perforating ulcer of the duodenum. [In these cases a diagnosis is very rarely made before operation. Percy Dean in 1894 performed the first successful operation. Smith advises incision over the seat of perforation; that is, if the condition is suspected. If we follow this rule, the incision will be above the umbilicus and through the right rectus muscle. The ulcer is usually in the first part, but may be in either of the other two portions. In order to expose the lesser omental cavity we must split the

[1] N. Y. Med. Jour., Jan. 11, 1896. [2] Boston M. and S. Jour., May 6, 1896.

gastrocolic omentum in part. The ulcer is simply inverted, excision being unnecessary. Drainage is required. (See *Year-Book* for 1896.)

Herbert W. Allingham[1] advises the use of **a new bobbin** for intestinal anastomosis which he thinks obviates disadvantages, notably in most of the other mechanical devices (Fig. 42). He maintains that some form of apparatus is necessary to unite hollow viscera to one another. The bobbin acts as a kind of splint while union is taking place, preventing any contraction or dilatation of the gut at the seat of union, and thus doing away with any chance of leaking. When no bobbin has been used the seat of suture has no support, and a very slight dilatation or contraction of the gut may allow some leakage. Again, rest and fixation favor union. He thinks that the bobbin of Mr. Mayo Robson is objectionable, because the flanges at the ends of the bobbin are separated from one another by about $\frac{3}{4}$ in.; hence when viscera are brought together it is necessary to use some kind of suture running from one to the other, a process which takes time. Moreover, when the viscera have been brought together over a bobbin they can slide from one end of it to the other. Senn's plates allow the ends of the incision in the viscus to fall together, and thus the communications between the viscera become too small later, because there is nothing to keep the openings patent while union is taking place. There are several objections to Murphy's button. The button may be delayed in the intestine for a very long time, as in Lane's case, in which it did not come away even in 160 days. The button might be unable to pass the ileocecal valve, and might cause obstruction at that point. In gastroenterostomy the button might fall back into the stomach, and then be unable to pass the pylorus or be vomited from the esophagus. It is not judicious to press intestines together at their seat of union by a button which can come away only by absorption or by sloughing of the pressed parts. No less than 5 cases have come to his knowledge in which sloughing with perforation took place at the seat of union, the patients dying from a consequent peritonitis. It is desirable that the intestines at the seat of union should be held together by pressure, but this pressure must not be too great or too small. It should not be sufficiently great to necessitate any absorption or sloughing in order to free the button. He believes that his bobbin remedies the above-mentioned disadvantages. The bobbin is of bone or ivory, and it consists of two cones with their apices coming together to form the center. They are carefully decalcified to within about $\frac{3}{16}$ cm., leaving at the junction of the two cones a hard, unyielding portion upon which any pressure from the suture is borne. The ends of the tubes are quite soft. There are several sizes. This bobbin keeps the parts at absolute rest, can be absorbed, and can be liberated without any absorption or sloughing of the parts it unites, and because of its shape it cannot slip away until the decalcified bone is absorbed. When the sutures in each piece of intestine are tied,

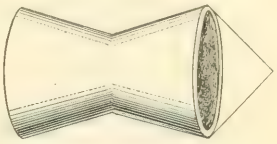


FIG. 42.—Allingham's bobbin (Lancet, Aug. 31, 1895).

[1] Lancet, Aug. 31, 1895.

the parts to be joined are with certainty brought together, and yet no excessive pressure is exerted upon the edges. The illustrations (Figs. 42–45) exhibit his bobbin and its use. Though the bobbin may be employed to unite intestines to stomach, gall-bladder to intestine, and indeed in any form of anastomosis, its use is most conveniently explained by presuming that two pieces of intestine are to be united end to end. Into or around each piece of intestine a continuous silk suture is passed, which includes in each stitch the peritoneum, the muscular coat, and the mucous coat (Fig. 43). One end of the bobbin is inserted into one piece, and the suture is pulled tight by a knot twice threaded, so that it will not slip out; the final tie is not made until the other end of the bobbin has been inserted into the other piece of bowel (Fig. 44). After this one of



FIG. 43.—Use of the bobbin, first step (Allingham, in Lancet, Aug. 31, 1895).

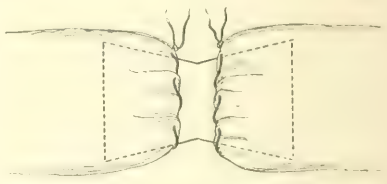


FIG. 44.—Second step (Allingham, in Lancet, Aug. 31, 1895).

the sutures is tightened up to its utmost. This brings the part down to the center of the bobbin. As the bobbin consists of two cones with their apices pointing to its center, the tighter the suture is drawn the more completely must it draw the intestine to the apex of the cone. Thus the parts are brought into exact apposition and are pressed together (Fig. 45), and a few Lembert sutures are inserted at various points, or a continuous Lembert suture may be used all around. It is wise to scarify the intestinal peritoneum for about $\frac{1}{2}$ in. around the seat of union, for this scarifying promotes the exudation of lymph. He has only had one opportunity of using this bobbin upon the living subject, and in this case it gave excellent results. [Many surgeons reject mechanical aids to operation, notably Abbe of New York. The question is still doubtful, and the future must solve the problem.]

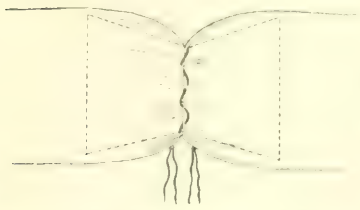


FIG. 45.—Third step (Allingham, in Lancet, Aug. 31, 1895).

Chaput[1] describes **a new button** for resection and anastomosis in intestinal operations. The annexed cuts (Figs. 46–53) display its shape and the mode of its application.

Another form of bobbin is described by P. J. Hayes[2] of Dublin. It is made of bone or ivory; the central part has been longitudinally segmented by means of a fine saw, and the ends of the bobbin up to a little beyond the extremities of the skin-lines are decalcified. (See Figs. 54–57.) Still another

[1] Jour. de Méd. de Paris, May 10, 1896.

[2] Lancet, Dec. 28, 1895.

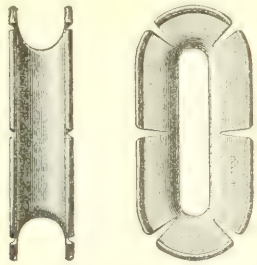
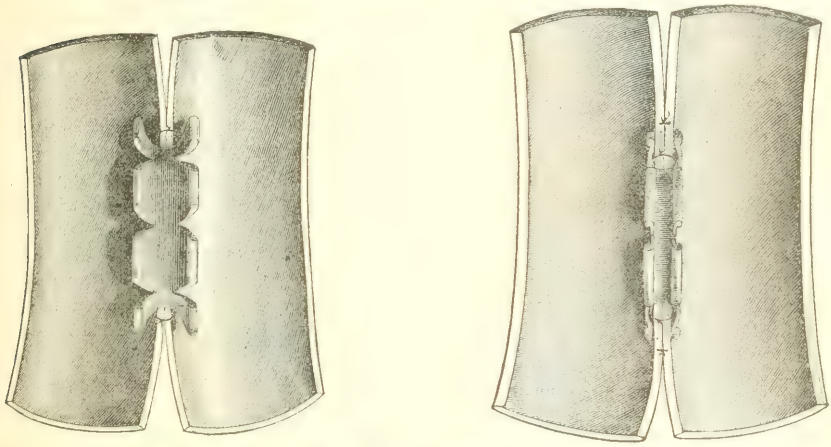


FIG. 46.—Button No. 5, side and front views (Chaput, in Jour. de Méd. de Paris, May 10, 1896).



FIGS. 47, 48.—The button in place. In Figure 47 the channel or gutter is open; in Figure 48 it is closed (Chaput, in Jour. de Méd. de Paris, May 10, 1896).

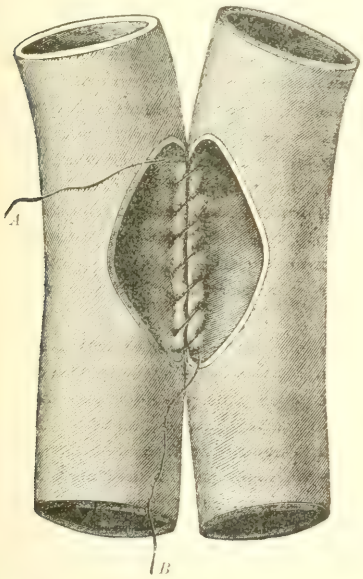


FIG. 49.—Completion of suture upon the posterior lips of the anastomosis with the thread *A B* (Chaput, in Jour. de Méd. de Paris, May 10, 1896).

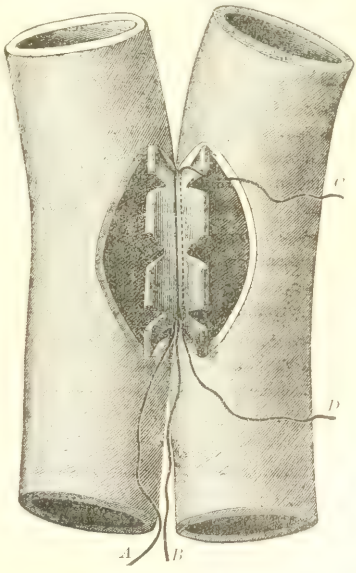


FIG. 50.—The thread *A B* has been tied on the bottom of the gutter; the thread *C D* is passed into the posterior groove of the gutter (Chaput, in Jour. de Méd. de Paris, May 10, 1896).



FIG. 51.—The thread *A B* of the preceding figure has been intentionally omitted. With the *C* end of the thread *C D* the suture is completed on the anterior end of the anastomosis (Chaput, in Jour. de Méd. de Paris, May 10, 1896).



FIG. 52.—The suture of the anterior lips complete. The ends of the threads *C D* are tied (Chaput, in Jour. de Méd. de Paris, May 10, 1896).

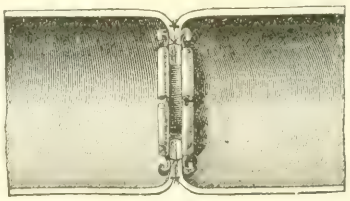


FIG. 53.—Circular suture completed with the button. In this figure the gutter has been closed (Chaput, in Jour. de Méd. de Paris, May 10, 1896).

form of bobbin for intestinal anastomosis is suggested by J. Jackson Clark[1] of London. In this the pressure is made by india-rubber rings, the edges of which are rounded off (see Figs. 58, 59).

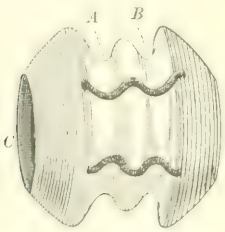


FIG. 54.—Double bobbin, shaded ends decalcified: *A*, unshaded central ridge and grooves, not decalcified: *B*, saw-lines are seen segmenting the undecalcified bone and extending a little way into the decalcified parts; *C*, lumen of bobbin (Hayes, in Lancet, Dec. 28, 1895).

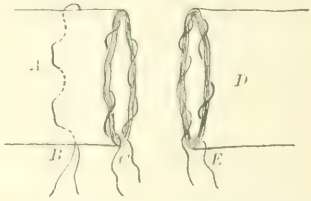


FIG. 55.—Intestine drawn on too large a scale. Shows proximal and distal portions of intestine prepared for end-to-end union. Marginal sutures traverse all layers of wall. Subserous pursestring only dips beneath peritoneal layer. *A*, proximal intestine; *B*, subserous pursestring suture; *C*, marginal suture; *D*, distal intestine; *E*, marginal suture (Hayes, in Lancet, Dec. 28, 1895).

Rogers[2] presents a method of performing **enterectomy** without the aid

[1] Lancet, May 9, 1896.

[2] Brit. Med. Jour., Apr. 11, 1896.

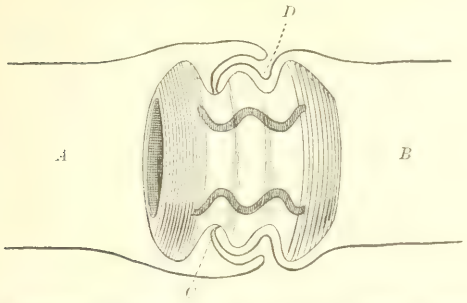


FIG. 56.—*A*, proximal intestine; *B*, distal intestine; *C*, the proximal groove where both marginal sutures secure the orifices of proximal and distal parts of intestine; *D*, distal groove where subserous pursestring presses proximal intestine over invaginated distal (Hayes, in Lancet, Dec. 28, 1895).

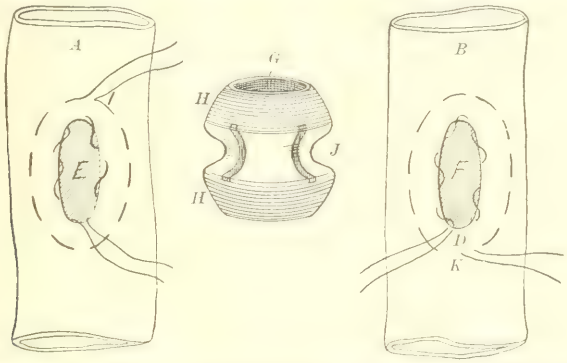


FIG. 57.—*A*, Intestine; *B*, intestine: *C*, marginal sutures; *D*, marginal sutures; *E*, aperture to receive bobbin; *F*, aperture to receive bobbin; *G*, lumen of bobbin; *H*, decalcified ends of bobbin; *I*, subserous pursestring; *J*, segmented undecalcified bone to be covered with a layer of "protective;" *K*, subserous pursestring (Hayes, in Lancet, Dec. 28, 1895).

of any special apparatus. He turns back the peritoneal layer from one end of the small intestine after resecting a portion of the gut, suturing the muscular coat thus exposed to the peritoneal coat of the other end of the intestine, subsequently turning down the reflected peritoneum over the first row of sutures, which are thus completely buried, and suturing its deep fibrous sur-

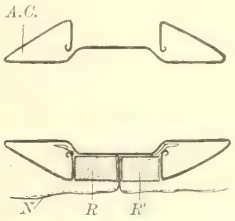


FIG. 58.—Longitudinal section of the bobbin, the intestine, *N*, and india-rubber rings (*R* and *R'*) shown in section below (Clark, in Lancet, May 9, 1896).

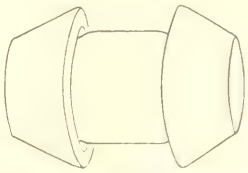


FIG. 59.—Outline sketch of bobbin (natural size) (Clark, in Lancet, May 9, 1896).

face to the outer serous surface of the unreflected portion of the intestine. He founds this operation on the suggestion of Greig Smith that serofibrous union

is more valuable than the union of peritoneum to peritoneum. (See *Year-Book*, 1896.) This serofibrous union unites quickly and firmly. The inner sutures are passed through the muscular coat only of one end of the bowel, whilst the outer sutures unite the peritoneal coats only. The accompanying diagrams exhibit the method of employing this suture (Fig. 60). The inner

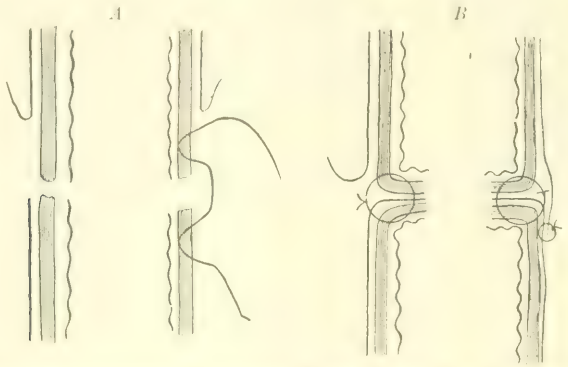


FIG. 60.—Suture employed in rapid enterectomy (Rogers, in Brit. Med. Jour., Apr. 11, 1896).

wavy lines represent the mucous membrane, the thick lines the muscular coat, and the thin straight lines the peritoneal coat. Figure 60, *A*, represents on the left-hand side the peritoneal coat turned back from one end of the bowel, and on the right side shows the method of passing the inner suture. Figure 60, *B*, shows on the left side the parts brought into apposition before tightening the inner suture, and on the right side the second suture in position, completing the junction. This mode of operating is said by Rogers to offer certain advantages. It can be inserted without the aid of special appliances. It can be completed in half an hour, or a little longer than the time required with the aid of special appliances, such as plates, buttons, and bobbins. The junction is a double serofibrous one, which Greig Smith has shown gives the maximum of rapidity and firmness. The mesenteric site can be made very firm by the apposition of the muscular coat of one end with the peritoneum of the other and the subsequent covering up of this suture by the reflected peritoneum. When special appliances are at hand they will probably be preferred to this method, but in emergency cases Rogers thinks it is a valuable plan. He thinks it quicker and more efficient than suturing with interrupted Lembert sutures, in which proceeding both Jacobson and Treves agree from 25 to 40 sutures are required, and even then the mesenteric junction gives cause for anxiety.

The Medical News (Nov. 16, 1895) contains a report of 111 additional cases operated on with an **anastomosis button** by Murphy. The London Practitioner of Feb., 1896, has given an excellent resume of the salient points of this article. The report includes 61 cases of gastroenterostomy for malignant disease, with 28 deaths. The 34 cases which have been added since the last report show a mortality of 7. Death is in most instances due to shock or exhaustion, proving that the operation should not be practised on people who

are in a very weak and emaciated condition, and on such people it cannot be expected to materially prolong their lives or modify their sufferings. In some cases the poor result of the operation was due to the employment of too small a button. In other cases the button slipped back into the stomach. Murphy tells us this unfortunate complication can be obviated by the use of special oblong buttons. He thinks that the posterior wall of the stomach is the proper situation to make our anastomosis. He never applies supporting sutures around the button, except in cases where they are necessary to relieve tension. He advocates scarifying the peritoneum of the stomach to hasten union; 7 cases of pylorectomy are recorded, of which 2 died; 1 case died of exhaustion, and the other died from peritonitis the result of leakage. Pylorectomy is only suited to recent cases of malignant disease; 51 cases of choleduodenostomy are reported, with 2 deaths: 1 death was from septic peritonitis, the infection having taken place during the operation; the other was from hepatic hemorrhage occurring in ruptured adhesions. This operation is employed when the cystic duct is permanently obstructed, when the common bile-duct is obstructed, when prolonged drainage is necessary in septic cholecystitis, and in cases of fistula of the gall-bladder where the continued loss of bile is responsible for advancing emaciation. He has altered his view in regard to the removal of calculi at the time of operation. He used to advise against it, but now recommends it. He says we should not undertake any very long operation in patients who have been jaundiced for a considerable time, because such patients are very prone to shock and to uremia. In considering the statistics of intestinal approximation the pathologic conditions which made the operation necessary must also be borne in mind, as the dangers of such lesions are often so extremely great as to make any operative proceeding whatever very risky. He reports 34 resections for gangrene with 8 deaths; 15 cases of intestinal approximation for fecal fistula with 3 deaths; 53 cases for nonmalignant obstruction with 6 deaths; 41 cases for malignant obstruction with 15 deaths.

In discussing the question of resection for intestinal perforation, either traumatic or pathologic, he tells us that the danger which accompanies such a condition is always extremely great, and quotes Leube, who from a study of 322 cases showed that if operation were performed within 12 hours of the injury, there was a mortality of 58.2%, while if the operation was performed at a later period the mortality was 79.5%. In bullet-wounds of the abdomen Murphy never eviscerates. He examines the entire intestinal tract, it is true, but never exposes more than 12 in. at a time. Each perforation as it is found is clamped with hemostatic forceps, but the whole extent of the injury must be definitely known before any operative measure is undertaken. The perforations made by a single bullet number from 1 to 18, and they are usually in adjacent areas if the small intestine is involved. We often find one or several openings in the small intestine, and in the same cases one or two openings in the large bowel. The median incision is the one he advises, and he says that it is often possible to remove in one piece the entire damaged section of

bowel. In some cases two or more buttons may be employed; 3 or 4 cases of the employment of the buttons for such intestinal resection have been placed on record. All the patients made an operative recovery.

Murphy considers the various objections which have been urged against the buttons. He maintains that since there is no tendency to contract, and the size of the opening is not too small, a No. 3 button is quite large enough for operations upon the small intestine, and a No. 4 button is only required in operations upon the large intestine. He does not think that the button can ever cause obstruction unless there is some preexisting stenosis. All its possible dangers are more than compensated for by the ease and certainty with which it can be applied. Another objection that has been made is that the lumen of the button itself may become blocked—3 such cases have been recorded—but Murphy says that if the surgeon keeps the patient's bowels in a loose condition after the operation, such blockage cannot occur. Murphy maintains that the greatest possible care must always be taken to see that there is not a ligation of too many mesenteric vessels. If too many of these vessels are ligated, sloughing and perforation are almost certain to follow. [Murphy's button enables the surgeon to lessen the time of operation. Many surgeons fear it will produce gangrene, and will not use it. Other surgeons condemn it because they have not used it properly. Others still will not employ it because they fear it will block or will not pass or make too small an opening. Murphy disposes of most of these objections. The opening is small, but then it does not, as a rule, tend to contract. The button does not fail to pass unless a constriction exists lower down, and this ought to have been found during the operation. When it does not appear in the stools a finger inserted into the rectum may discover it. In gastroenterostomy there is some danger of retention, but this may be prevented by using an oblong button. Blocking will not take place if the feces are kept liquid by salines. It is not necessary to surround the line of serous junction with inversion sutures; they do more harm than good, and take time to insert. The button is a time-saver, and in abdominal operations saving time is often saving life.]

Kidd[1] reports 3 remarkable cases in which **intestinal obstruction** was due to fecal accumulation **associated with displaced kidney.** In each of these cases there was a long history of constipation. The symptoms of obstruction were pronounced. Distinct swelling was manifested in the hypochondriac and iliac regions. The signs of obstruction passed away under the influence of opiates, fomentations, starvation, and enema. As the obstruction passed away in each case the tender mass diminished in size and was made out as a displaced kidney. Kidd previously described 4 cases of a similar sort. All of these 7 cases were women. The fecal accumulation in this case was in the right half of the colon, and the reason of the obstruction was purely mechanic. A very slight degree of pressure on the lumen of the large intestine suffices to partially arrest the upward passage of its contents. As the nerve-supply of the right half of the colon and that of the suprarenal body

[1] Lancet, Dec. 21, 1895.

and kidney is derived from the outer side of the solar plexus, and as the nerves of the suprarenal body are large and directed horizontally outward, it is quite reasonable to suppose that a displaced kidney may interfere with the nerves of the organ in a way which may communicate itself to another organ whose nerves arise from a neighboring part of the great plexus; hence the obstruction may be partially mechanic and partially nervous. The fact that many displaced kidneys give rise to no symptoms does not disprove this suggestion as to the connection between the renal and suprarenal plexuses and the superior mesenteric plexus, for many displaced kidneys are tender and somewhat enlarged for a short time only, and influence through the nerve-relation only takes place during periods of tenderness and enlargement. Patients with displaced kidneys should be instructed to attend to the action of the bowels as long as they live.

Winter[1] presents 3 cases of **intestinal obstruction** which he thinks were due to **occupation.** The patients were cork-cutters, and the severity of the symptoms was in direct proportion to the length of time they had been in the employment. The cases occurred in one house, and a careful investigation proved that they were not due to any errors in diet. In pursuing their occupation cork-cutters assume a bent position of the body, which probably constricts the gut sufficiently to cause obstruction. Each case gave a history of chronic constipation which began a few weeks after engaging in that occupation. The mere fact that the occupation was sedentary fails to account for the condition, as the patients were young and healthy men and accustomed to take much physical exercise out of working hours. Winter thinks that a person engaged in any employment in which a similar position is assumed is liable to an attack of intestinal obstruction, and holds that in such an event the physician should make a thorough examination into the condition of the sigmoid flexure. Each of these patients recovered.

Legeue[2] discusses the subject of **postoperative intestinal obstruction.** He states that intestinal obstruction after abdominal operation is not infrequent. Spencer Wells and Fritsch estimate that 1% of cases after ovariotomy develop obstruction. [Greig Smith says 2% of all deaths after celiotomy are due to it.] Legeue has collected 57 cases, 27 of which followed ovariotomy; 9 followed removal of the appendages, and 4 abdominal hysterectomy; 9 followed vaginal hysterectomy; and 8 followed operations for hernia. In some cases the symptoms arose within 10 or 15 days of the operation; in others, within 3 or 4; in others, again, they did not arise for months or years. Many pathologic conditions may be causative of such obstruction: 1. Obstruction may result from some obstacle arising at the seat of operation. The commonest obstacle is adhesion between the coil of intestine and the raw surface, the raw surface being possibly the edges of the abdominal wound or the pedicle of a tumor or the stump of a divided portion of omentum, or the opening at the top of the vagina which is left by a vaginal hysterectomy. Such an obstacle may be due to the use of gauze in plugging the cavity or to

[1] Am. Med. Surg. Bull., Mar. 21, 1896.

[2] Gaz. des Hôp., Nov. 23, 1895.

the use of pedicle-forceps applied behind the pedicle of the tumor. The adhesions which arise from such maneuvers may not be the primal cause of the obstruction, but may lead to other conditions which cause obstruction, such as a volvulus or a twist in the gut. Anchoring the pedicle of the ovary or the uterus in the abdominal incision may give rise to obstruction, and operations for intestinal anastomosis may also induce it. Some cases have been due to plugging of the vagina too firmly for hysterectomy, thereby blocking the rectum by pressure. Some few instances are due to paralysis of the gut. 2. Obstruction may result from some obstacle independent of the focus of operation, although such obstruction is far rarer than that which we have just discussed. Legeue mentions 3 cases, in all of which the site of the obstruction was the splenic flexure of the colon, the transverse colon having been displaced as the result of the operation. In 1 case obstruction came on 3 days after operation; 5 days after operation celiotomy was performed, and a band was found reaching from the spleen to the transverse mesocolon, which caused flattening out of the splenic flexure. The patient died, and postmortem examination showed that as long as the transverse colon was kept in the position it must have held before the removal of the cyst by the first operation there was no obstruction, but as soon as the cyst was removed it was allowed to fall downward and obstruction must have occurred. In another case which occurred in the practice of Laroyenne of Lyons there was no band, but the splenic flexure fell down in the same manner. Legeue maintains that the splenic flexure is naturally kept in position by a peritoneal reflection shaped like a fan, which he calls the left colic ligament. When the abdomen is filled by a large ovarian cyst the transverse colon is pushed up, and this ligament becomes secondarily shortened. As soon as the cyst is removed the colon falls into its normal place, the shortened ligament makes traction, and obstruction follows. In the third case obstruction arose in the splenic flexure of the colon because of traction exerted by the removal of a very large piece of omentum during the radical cure of hernia. 3. Obstruction arising apart from any mechanical obstacle. Under this distinction the author includes those disputed cases in which obstruction arises from paralysis of a very small segment of the bowel. Such cases are very common after strangulation, not unusually cause death, and yet after death the postmortem discloses no cause for the condition. Legeue believes that such cases do exist, and are not always due to acute septic poisoning or to obstruction which ceased after death. The author discusses the prevention of adhesions in abdominal operations. He tells us that it is impossible to remedy the raw surfaces which remain after dividing adhesions, though we should as far as possible cover these raw surfaces with serous membrane if the attempt does not involve the expenditure of too much time. Apart from such states, there are two great causes of adhesions—the irritation caused by antiseptic agents and by exposing the parts to the air. Normal salt-solution is the only fluid which should be applied to the contents of the abdomen. The experiments of Walthard have proved that if the intestines are exposed to the air for more than 20 minutes, endothelial desquama-

tions take place and adhesions are bound to form. The great preventive of this condition is wrapping the parts in gauze wrung out of normal warm salt-solution. The author then discusses the diagnosis of these conditions. He tells us that the suppression of flatus is complete in obstruction, is never complete in peritonitis, is very rarely complete in intestinal paralysis. Vomiting if due to chloroform usually ceases soon, but if vomiting persists for several days or if it begins again after once stopping, the suspicions of the surgeon should be excited, and he should never wait to operate until the vomiting becomes fecal. Temperature, as a rule, is low in obstruction and elevated in peritonitis, but this is not always the case. Pain is great in peritonitis, and there is rarely much abdominal tenderness in the early period of obstruction. There is no characteristic sign of obstruction, but the combination of phenomena is tolerably positive. These combination-phenomena are the failure to pass flatus and feces, the existence of persistent vomiting without marked elevation of temperature, and the painless distention of the abdomen persisting after the administration of purgatives or enemata. The treatment he advises is the administration of a purgative followed by the use of enemata. If these means fail to relieve the symptoms, open the abdomen, find the obstruction, and treat it according to the general rules of surgery. He believes in dealing directly with the obstruction rather than making an artificial anus. [Open the abdomen through the old incision.]

Sweetnam[1] maintains that **tympanites** may be relieved by posture. In very extreme distention the knee-chest position is advisable, but in cases of moderate distention we may place the patient upon the side and elevate the foot of the bed. This treatment is applicable not only to distention which follows abdominal operations, but it might be applied with advantage to typhoid fever. It seems to do no good in subjective cases of general peritonitis. He was led to try this plan of treatment because while watching Kelly of Baltimore making a rectal examination, the patient being in the knee-chest position, he was able to see the rectum straighten out, the additional length being contributed by the unfolding of Houston's creases. These folds absolutely disappeared. It may be necessary to keep the hips in the elevated position for 10 or 15 minutes before the contents of the abdominal cavity gravitate sufficiently from the pelvis to enable the upper portion of the rectum to pass out of the pelvis toward the abdominal cavity. Relief will not be secured until this occurs. In marked tympanites the distention is practically confined to the large intestine, and obstruction to the escape of flatus is due to the downward pressure of the descending colon and sigmoid flexure upon the upper portion of the rectum, forcing the folds of Houston one upon the other and bringing about for the time being an impermeable stricture. An attempt to pass this by the soft-rubber tube will fail, because the tube will coil upon itself. By inverting or partially inverting the patient we remove through the aid of gravitation the pressure from above and thus liberate the imprisoned gas. [In tympanites following

[1] Ann. of Surg., Mar., 1896.

celiotomy we would not be willing to depend upon posture alone, but would also pass a rectal tube and purge the patient.]

Beck[1] writes an interesting and instructive article upon **Subphrenic Abscess,** reporting 5 successful cases of his own, and presents a study of the topography, pathologic anatomy, diagnosis, prognosis, varieties, course, and therapy. The treatment must be surgical. Evacuation can only be effected by a wide opening, and this opening is secured by resecting a piece of the rib. [Maydl in a well-known monograph makes 12 groups of subphrenic abscesses: 1. Stomachal; 2. Intestinal; 3. Perityphlitic; 4. Due to echinococci; 5. Due to trauma with unbroken skin; 6. Cholangitic; 7. Perinephric; 8. Metastatic; 9. Due to wounds of the subphrenic space; 10. Costal; 11. Thoracic; 12. Various (as fat-necrosis from pancreatic disease). Abscesses are further divided into extraperitoneal and intraperitoneal, the former most likely to break into the pleural sac. Spontaneous cure may occur from rupture into the lungs or a hollow viscus, but the surgeon must seek cure by operation and not hope to gain it by luck. Maydl shows that out of 104 cases not operated upon only 6 recovered, while out of 18 cases operated upon only 11% died. Most of these cases, Lampe shows, take origin from the stomach (see Münch. med. Woch., 1895, No. 20), because of perforation of gastric ulcer or more rarely of cancer. Most cases from ulcer occur in the left subphrenic space, most cases from cancer in the right space. In subphrenic abscess arising from appendicitis Lampe asserts that the pus either mounts up to the subphrenic cellular tissue along the cellular tissue of the mesocolon, or else abscess of the liver and subphrenic space is caused by pylephlebitis beginning in the veins of the cecum and appendix. Lampe says there is no absolutely certain sign of perinephric abscess, for Leyden's sign may be absent (gas in subphrenic pneumothorax). In suspected cases operate at once.]

The Hunterian Lectures for 1895 were delivered by Mr. Timothy Holmes[2] of St. George's Hospital. These lectures are characterized by the same features for which the writings of Mr. Holmes have always been noted. Accuracy of statement, clearness of detail, and comprehensive grasp have always been his leading characteristics as a surgeon. He presents **the experience of St. George's Hospital in celiotomy,** exclusive of gynecologic operations, from 1888 to 1894, inclusive. He was anxious to produce an unselected and continuous series of hospital cases. We are inundated in the medical papers with successful cases of celiotomy for various conditions, and from this side of things two opposite conclusions seem to be drawn: Some seem to feel that one has nothing to do but to open the abdomen and all difficulties vanish; others reflect that published cases have been published because they were successful, and if they had not succeeded would never have been heard of—that even when distinguished surgeons give their whole experience, that experience represents the practice of a specialist who is called because the case is a promising one. The unselected and complete experience of a hospital into which a man is sent, not because his case is promising, but too often because

[1] Med. Rec., Feb. 15, 1896.

[2] Brit. Med. Jour., July 5, 1895.

it is hopeless, would tell a very different story from that of private practice, because the private practitioner is obliged to reject the worst cases, while the hospital surgeon, if he does his utmost duty, takes even the faintest chance of saving life; indeed, sometimes, as in railway injuries, he has to operate without any chance of saving life, but merely to procure his patient an easier death. The cases reported are shown in the following tables:

	Cases.	Recovered.	Died.	
Injury	3	0	3	
Exploratory	5	3	2	
Abscess	11	10	1	
Peritonitis	6	1	5	
Tuberculous peritonitis	3	1	2	
Peritonitis from twisted ovarian pedicle	1	1	0	After ovariotomy.
Perforation of appendix, etc.	10	0	10	
Removal of appendix	3	2	1	
Hydatids	6	4	2	
Pancreatic cyst	1	1	0	
Hydronephrosis	1	1	0	
Uterine	2	1	1	Exploratory operations for tumors which turned out to be uterine. One recovered after hysterectomy.
Other tumors	5	1	4	
Gastric ulcer and duodenal ulcer	14	4	10	
Cholecystotomy	3	3	0	
Gastrojejunostomy	4	3	1	
Intussusception	5	0	5	
Kink and volvulus	4	1	3	
Strangulation by bands	11	4	7	
Stricture of bowels	7	0	7	
Internal hernia	4	1	3	
Gangrene of cecum	1	0	1	
Total	42	110	68	

Mr. Holmes proceeds to discuss specifically and in detail celiotomy in limited abscess, for peritonitis, fatal cases of diffuse peritonitis from perforation, for tumors, for perforated ulcer of stomach or duodenum, for intussusception, for kinking and volvulus, for strangulation by bands, and for stricture of the bowel. These tables and the comments upon them are of extreme value and are worthy of an attentive study.

Williams[1] reports a case showing the value of a **left supraclavicular adenopathy** as a revealing symptom of intraabdominal cancer. Several of these cases have been recorded by Continental observers, demonstrating the frequency of the association of the enlargement of the left supraclavicular lymph-glands with malignant disease of the intraabdominal region. Troisier first directed attention to this sign in 1888. In Williams' case the left supraclavicular lymph-glands, as well as those of the upper part of the axilla, were enlarged and hard, and thus by interfering with venous circulation had caused edema of the hand and forearm. The growth was due to dissemination of the disease through the medium of the thoracic duct. The existence of this symptom in the case completely negatived exploratory operation. The tumor was probably malignant endothelioma of the omentum.

[1] Lancet, Aug. 3, 1895.

Ramsay[1] inquires, **Why is the abdomen opened in the middle line?** He says that in text-books we find that the linea alba is almost invariably commended as the proper situation for incision, and in a few instances when it is considered wise to deviate from this incision we are told to incise the linea semilunaris. From the fact that this assertion is so dogmatically made and so universally maintained we would infer that there must be some decided advantage to be gained by opening the abdomen in either the linea alba or the linea semilunaris. The advantages which are claimed are that the vascularity is low in the middle line, and therefore the hemorrhage is light; that the structures cut through are less important; and that by either of these incisions we gain free access to all parts of the abdominal cavity. In the first point we see no advantage, really a disadvantage. Although the abdominal wall contains more vessels in other regions, there is never any hemorrhage which the surgeon cannot most readily control, and the fact that the linea alba is not vascular is an evidence that union cannot be rapid, and when permanent healing is slow in taking place hernia is apt to arise. The fact that there are no important structures is certainly not an advantage. The incision goes through fibrous tissue layers that strongly resemble each other, and makes it a matter of difficulty, especially for inexperienced operators, to know the depth of incision; and this is particularly true when inflammation is excited. It is very hard to approximate the layers accurately together, and they always adhere, so that the depth of the scar when found is barely $\frac{1}{8}$ in. thick. We notice this constantly when making an incision through a scar of an old incision. The third point, if true, would be distinctly in favor of median incision, but this claim is theoretic and not practicable, as we can obtain ready access by other incisions. One great disadvantage of the median incision is that, should it be necessary to extend it upward, the umbilicus comes in the way. The umbilicus can never be absolutely cleaned; the knife must be carried around it, or else the umbilicus must be removed. The situation which Ramsay recommends as the proper one for the incision is through the middle of the rectus muscle on either side. The parts are vascular, but the hemorrhage is arrested with the greatest ease. The muscles are not subjected to any severe injury, as the muscular fibers are separated longitudinally by blunt instruments. The incision may be carried as high up as the ribs or as low down as the pubes without any difficulty at all, as we have no umbilicus in the way to interfere with us. The layers are distinctly marked, so that it is impossible with ordinary care to wound the viscera. We have the freest access to all parts of the abdominal cavity, an excellent scar is left—one that does not pucker—and the separate layers are not coherent. When the wound is carefully closed the risk of hernia is extremely slight. The best method of closing the wound is to run silkworm-gut sutures through all the layers. These are placed in situ and held by forceps; then the peritoneum and posterior layer of fascia are brought together with fine silk sutures, either the interrupted or

[1] Lancet, Nov. 30, 1895.

continuous, and then the anterior layer of the fascia is brought together in the same way. This brings the muscle firmly into contact, maintains the original thickness of the belly-wall, and prevents coherence of the fascial layer. If there is temporary drainage required, necessary sutures are placed in situ and marked with knots. These can be tied accurately when the tube is withdrawn. Ramsay has used this incision in 5 cases, and has found that the advantages claimed for it are real and not theoretic. He thinks that all students should be taught that there is one place where the abdomen should not be opened; that is, the linea alba.

Clubbe[1] discusses the question of **celiotomy for intussusception in very young children.** He reports 7 cases. The oldest case was not over 6 months of age. Of these, 4 made a good recovery. Clubbe says that very young children bear the shock of celiotomy extremely well. Whereas it is true that many cases may be relieved by the use of injections of water or air or oil, this treatment contains certain elements of danger. It is impossible to regulate exactly the amount of pressure, and if any ulceration exists in the bowel, rupture may occur. Clubbe thinks that celiotomy should be done in every case when the surgeon is sure that he has to treat an intussusception which cannot be reduced by moderately forcible rectal injections. He did not drain any of these cases subsequent to operation. [Most cases of intestinal obstruction in children are due to intussusception, and in a majority of them the attack begins with great suddenness. The ileocecal form is the most common, though either the colon alone or the small intestine alone may be involved. Injections can be best given when the patient is anesthetized and in the knee-chest position, but they should only be tried very early in the case (first 24 hours). A method of operating devised by Paul will be found in the *Year-Book* for 1896, page 224.]

Rydygier[2] has studied the cause of **intestinal invagination** and has investigated the records of 84 cases. He holds that if nonoperative procedures have been tried and failed, operation should at once be resorted to. When we do a celiotomy and the intestine seems to be in good condition, we should pull apart the invagination; but if the intestine looks suspicious, the peritoneal cavity should be packed off with iodoform-gauze or the suspicious portion of the intestine should be drawn outside of the belly-wall. If it is found impossible to pull apart the invagination, resection should be practised, and when the sheath of the invagination is profoundly altered the entire invagination should be resected. He does not believe in the practice of an enteroanastomosis, and holds that an artificial anus is only to be made in case there is collapse. In case of chronic invagination we may employ medical treatment and nonoperative methods for a week, but if they fail up to this period, they should then be abandoned. Celiotomy should be performed and resection practised. The presence of a great many adhesions may justify enteroanastomosis. The formation of an artificial anus should not be thought of. [In speaking of operations upon infants we recall that Bogert operated

[1] Australas. M. Gaz., No. 10, 1895. [2] Beiläge z. Centralbl. f. Chir., 1895, No. 27.

successfully for intussusception upon a baby 4 months of age,[1] and that Carpenter operated successfully upon a baby 2 months old.[2] In each case celiotomy was performed.

How large a number of cases of obstruction are due to intussusception is shown by the statistics of Lichtenstein and Bryant. In 1652 cases of obstruction, excluding hernia, 657, or about 40%, were due to invagination. In 593 records compiled by Lichtenstein it was noted that 131 of the patients were under 1 year of age.

The best rule to follow in these cases when they are acute and recent is to etherize, make one attempt to relieve by injection, and, if this fails, at once do celiotomy, pulling apart the invagination if possible, and if this is not possible resecting the intussusceptum.]

Golding-Bird,[3] concerning **skin-bridging in inguinal colotomy,** tells us that Mr. Bidwell[4] described a method of ensuring free exit of feces from the upper opening of the bowel after inguinal colotomy, and at the same time of preventing recession of the gut into the abdomen. His method consists in bringing the upper lip of the skin-wound through an opening made in the mesosigmoid and attaching it to the lower lip of the wound. The bowel is thus placed over a bridge of skin instead of one of glass or rubber, as used to be employed. Golding-Bird endorses all Mr. Bidwell says in favor of this proceeding. The operation is rapid, it is unnecessary to suture the bowel to the parietal peritoneum, and in most cases only 1 suture is needed to fasten the bridge of skin. Golding-Bird did it in 2 cases with gratifying success. [We have used it in several cases, and find it easy of performance and satisfactory in result. The surgeon must of course be sure which is the lower end, for to constrict the upper end would be unfortunate. It seems to us that the word "colostomy" is the correct designation of the operation, and not "colotomy."

The operation of iliac colostomy is preferable to lumbar colostomy. Deansley truly says that colostomy should not be performed without first locating the obstruction. Accurate localization is often impossible without first opening the abdomen: the abdominal incision preliminary to iliac colostomy permits of determining with accuracy the seat of constriction. Lumbar colostomy is only permissible when the seat of obstruction is definitely known, but even when performed with care the lumbar operation does not completely divert the fecal current. The lumbar operation, in our opinion, should no longer be performed.

In a mere preliminary opening of the bowel, or colotomy, the portion of bowel should never be fixed outside, as in colostomy. Deansley says when a temporary opening is desired we should simply make a fecal fistula. This is done by opening the cecum, inserting into it a small tube, returning the cecum into the belly, and keeping it in contact with the abdominal wall by traction upon the tube and several stitches fastening the bowel and parietal peritoneum, but never the bowel and skin.[5]]

[1] Brooklyn Med. Jour., Sept., 1895.
[2] Med. Rec., June 6, 1896.
[3] Brit. Med. Jour., Dec. 28, 1895.
[4] Ibid., Apr. 6, 1895.
[5] Birmingh. Med. Rev., xxxviii. No. 204.

Stephan's[1] patient had labored under an obstinate dysentery which drugs had absolutely failed to relieve. He determined to establish an **artificial anus,** and applied local treatment through this opening. The case was cured of the dysentery, and in a few months the artificial anus was closed by operation.

DISEASES OF THE PANCREAS AND SPLEEN.

Leith[2] presents a study of **rupture of the pancreas.** He makes one group of cases in which death very quickly followed the injury, the symptoms being simply shock and collapse, and no symptom existing which pointed to pancreatic lesion. There were no lesions upon the surface of the abdomen, and this proves that diagnosis without exploratory incision is impossible. A vertical incision about 3 in. long should be made in the mid-line or a little to the left of the mid-line in the epigastric region, which will enable the surgeon to explore the anterior surface of the pancreas most satisfactorily. He tells us that if we introduce an electric lamp inside of a Fergusson speculum, we shall be enabled to inspect the pancreas and its peritoneal covering. The usual cause of death in these cases is hemorrhage. Serious lesions of other viscera are, as a rule, present, and treatment must be entirely symptomatic if any exploratory celiotomy is not undertaken. After an exploratory celiotomy hemorrhage may be arrested by pressure and the application of sutures passing through the peritoneum covering the gland alone; these sutures will bring the ruptured ends of the pancreas together. It should be remembered that the pancreatic peritoneum is closely adherent to the gland, and that there is no fat or any other structure between it and the gland. Hence peritoneal sutures will approximate the separated surfaces of the pancreas. One trouble in this procedure is that blood or pancreatic juice is liable to accumulate between the two surfaces, separating these surfaces and leading to cyst-formation.

Senn made a number of experiments upon animals, and came to the conclusion that the two sides of the wound in the pancreas should be ligated separately before the peritoneal sutures are applied. This will arrest the hemorrhage, prevent accumulation of pancreatic juice, and closely approximate the two surfaces. Slight cases of pancreatic rupture occasionally happen, and it is quite likely recover. In fact, autopsies have proved this. An injury in the epigastric region may be followed in a greater or less time by a pancreatic cyst. In a table which Leith publishes one cyst appeared as early as 10 days after the injury, and the other did not appear for 8 years. Leith's table contains the records of 17 traumatic cysts.

Cathcart has explained the formation of the cysts as follows: The laceration of the pancreas due to injury leads to extravasation of blood, and this blood is mixed with the secretion of the pancreas from the lacerated ducts. We thus have a hematoma, to which is constantly added pancreatic fluid. This fluid must be somewhat irritant, and this tends to cause the formation of a capsule. These cysts have been treated by aspiration, but this method is

[1] Berl. klin. Woch., 1896, No. 1, p. 21.

[2] Edinb. Med. Jour., Nov., 1895.

not curative, and is very dangerous, as the cyst almost certainly refills, and the injection of irritant fluids is liable to cause a fatal peritonitis. These cases should be treated by celiotomy. The cyst should be lifted forward and incised, and a pancreatic fistula established to maintain drainage. This fistula after a time heals. There are 17 cases on record in which this method was employed, and in 16 of them it was successful. Kreeke says that out of 27 cases treated by incision and drainage, all recovered, but in those cases in which the cyst was dissected out 3 died. The method of anterior incision and drainage fails to cure some few cases. It is most applicable to movable cysts, which come forward readily from the anterior abdominal wall, but is not so applicable to those cysts very broad posteriorly and not very movable. It is difficult to reach such a cyst to incise it from the front, and it is not easy to bring it forward to the abdominal wall. Cathcart and Littlewood have maintained that in these cases a posterior counteropening can be made with the greatest ease. Leith came to the conclusion that cysts might be reached by a primary posterior operation. This can be very easily performed upon the cadaver. A vertical incision 3 in. long is made at the outer border of the left erector spinæ muscle, the incision beginning just above the 12th rib. After reaching the upper border of the quadratus lumborum muscle the finger is pushed above it, and finds the posterior surface of the kidney and accurately locates the situation of the renal vessels. We know that the tail of the pancreas and the posterior and outer wall of the lesser omentum lie just above and just inside these renal vessels, and by inserting a probe we can enter the sac of the lesser omentum easily, either through the mesocolon below the inferior margin of the pancreas or through the posterior layer of the peritoneum above the pancreas. There is no likelihood of injuring the suprarenal capsule or any other adjacent structure. When fluid was contained in the sac of the lesser omentum the finger could distinctly make out fluctuation, and the fluid could be most readily evacuated by pushing a drainage-tube into the sac of the lesser omentum just above and just inside these renal vessels. This procedure would be just as easy in the case of pancreatic cysts. Cotterill adopted this method of reaching a pancreatic cyst in the cases which he had in his charge. He entered the cyst below the vessels of the kidney, and the patient made a good recovery. Other operators have adopted the posterior incision for fluid to drain the sac after finding it by the anterior incision. Gould had such a case, in which when he made the anterior incision he was unable to bring the cyst to the surface, and therefore made a posterior incision and drained. The fistula closed rapidly. If the posterior incision had been used at first, the cure would have been equally successful. Leith strongly recommends the posterior incision. It is very easy of performance, has great advantages over the anterior incision, affords far more perfect drainage, and hence secures much more rapid convalescence. Even if the surgeon fail to reach a cyst by a posterior incision, it would in no wise interfere with the subsequent anterior incision, and would even in such cases permit the establishment of posterior drainage.

Sutton[1] records 3 successful **splenectomies.** [It is considered proper to remove the spleen in some cases of hypertrophy (simple or malarial), of floating spleen, injury, abscess, cystic disease, and malignant disease. Most authorities condemn the operation in cases of leukemia, because of the great mortality. In wandering spleen better results have been obtained by splenectomy than by fixation. In operations upon the spleen the great dangers are shock and hemorrhage. Shock is often inordinate, and traction upon the pedicle greatly aggravates, because, it has been said, of pressure upon the splenic nerve plexus. The excessive hemorrhage is in some cases due to hemorrhagic diathesis, which condition is sometimes associated with enlarged spleen (Mosler).]

Spanton[2] writes a paper upon **Splenectomy,** and presents the notes of 3 cases. The first case was one of simple hypertrophy of the spleen in which death occurred from hemorrhage 5 hours after operation. The second was a case of simple hypertrophy in which death from shock occurred 11 hours after operation. The third was a case of simple hypertrophy in which operation was followed by recovery. Spanton says that splenectomy has now been performed sufficiently often to enable us to estimate its sphere of usefulness.

In 25 cases of leukocythemia only 1 recovered, and splenectomy in this case should not be performed; 38 cases of hypertrophy showed 20 deaths: these are the cases which most often present themselves to the surgeon. The mass drags on the stomach, makes pressure on adjacent organs, occasionally sets up local peritonitis, and usually renders life intolerable. A solid tumor causes a much greater amount of discomfort than does a fluid tumor of the same weight. Taking 3 decades, we have this remarkable result: from 1865 to 1875 the mortality of splenectomy was 80%; from 1876 to 1885 it was 45%; and from 1886 to 1895 it was 20.68%. He thinks that for wandering spleen we should adopt the operation of splenorrhaphy, as he would prefer it to the greater risk of splenectomy. The chief risks of the operation are shock and hemorrhage, and in the large proportion of the cases both of these conditions have been met. We easily understand why shock should be formidable from the close connection of the spleen with the solar plexus, but in most of the recorded cases we find shock was first noticed when the attempt was made to remove the organ from the abdomen. In his own cases this was most marked the minute the spleen was pulled upon in the slightest degree. In his last case he was so struck by this fact that it occurred to him that it might be caused by dragging on the diaphragm. Influenced by this idea, he decided to begin by dividing the suspensory ligament. This was transfixed, ligated, and set free, and the minute this was done all signs of collapse or shock passed off. He thinks that beginning with this suspensory ligament makes the rest of the operation easier, and that this method should always be adopted when possible. In most of the cases the suspensory ligament has been dealt with last. As to securing the vessels, no general rule can be laid down, though when possible the splenic artery and vein had best be ligated separately. In many cases the vessels divide before they reach the spleen,

[1] Lancet, No. 3764, 1895.

[2] Brit. Med. Jour., Nov. 2, 1895.

and we have a very broad pedicle with many vessels to be dealt with. [The suggestion that shock may be due to traction upon the diaphragm, and hence that the suspensory ligament should be first dealt with, is extremely important. The author differs from many writers in advocating the operation of splenorrhaphy.]

Plucker[1] of Cologne writes an article upon **Splenopexy for Wandering Spleen.** The old treatment was extirpation, which he tells us is a procedure as irrational as would be the operation of nephrectomy for a faulty kidney. Rydygier first advised that the organ be firmly anchored in its proper situation. This procedure is far safer than splenectomy, although it contains certain elements of risk: the operation is difficult and the fixation is not certainly permanent. [We must remember that in these cases splenectomy is very successful and is permanent.] Plucker cites a case of Bardenheuer's in which, instead of anchoring the spleen by intraperitoneal sutures as in the plan of Rydygier, it was fixed outside the cavity of the peritoneum in the subperitoneal tissues. The spleen was forced through a small opening in the peritoneum; the parietal peritoneum was then sutured to the peritoneal coat of the pedicle, and thus communication with the peritoneal cavity was closed. To anchor the spleen a suture was passed round the 10th rib and also through the lower end of the viscus. A number of smaller sutures were employed to fix it to the fascia and connective tissue. The case went on to a favorable conclusion. The incision employed by Bardenheuer consisted of 2 lines, 1 running longitudinally from the 10th rib to the iliac crest, another taken off at right angles from the upper extremity of this incision. He thus formed a flap composed of skin and muscles which could be freely detached.

Douglas[2] of Vanderbilt University considers **splenectomy statistically,** and reports a case. The statistical table is very thorough and valuable. The reported American operations are 29 in number, with 11 deaths.

Douglas speaks of echinococcus of the spleen, and discusses 6 cases with 4 recoveries; 5 cases of primary sarcoma with 2 recoveries; leukemia, 36 cases with 5 recoveries. The successful operators for leukemia were Assaky, Ceci, Landfois, Franzolin, and Hartman. The table shows 40 cases of malarial hypertrophy with 24 recoveries, and to this list Douglas adds a successful case of his own. In 59 cases of simple hypertrophy there were 34 recoveries, a mortality of 42%; 3 cases of simple cystoma, all of which recovered; 3 cases of primary nontraumatic abscess and sloughing with 3 recoveries; 2 cases of floating spleen treated by splenectomy, with 1 recovery; wounds of spleen show 43 cases with 42 recoveries (in 8 of these only the part protruding was removed). As long ago as 1700, Taritoni removed the spleen. [Mosler has gathered records of 15 cases of splenic echinococcus which were aspirated; 6 died, 6 recovered, and 3 are unrecorded. Trinkler estimates the mortality at 21.7%. Hahn has collected 7 cases in which splenectomy was performed for hydatid disease, and 2 of these cases died. Splenectomy for hydatid disease is a safer operation than aspiration.]

[1] Centralbl. f. Chir., Oct. 5, 1895. [2] Jour. of Am. Med. Assoc., Apr. 25, 1896.

DISEASES OF THE LIVER AND GALL-BLADDER.

Rupture of the Liver.—Bryant[1] says that severe collapse follows rupture of the liver, and this severe collapse and a history of injury to the right side of the abdomen or thorax might suggest the lesion, but there are no symptoms which definitely point to it. Bryant quotes from cases which definitely prove this assertion. Had such a condition been even thought of in some of these cases by the surgeons in attendance, recovery might have been obtained instead of death. Cases of limited rupture of the liver are quite capable of recovery. This is shown by a specimen in the museum of Guy's Hospital which was taken from the body a week after injury. When recovery follows limited rupture of the liver the case is generally supposed to have been a local traumatic peritonitis. Severe laceration of the spleen is likely to produce death from hemorrhage, although a limited laceration may be recovered from, and may be looked upon as a case of local peritonitis, but in every case of injury in the left side of the abdomen or thorax the surgeon should think of the possibility of rupture of the spleen. Bryant then makes some observations upon rupture of the stomach.

Slaughter[2] reports a case of **amebic abscess of the liver** in a child, and comments upon the extreme rarity of these abscesses in children even in the tropics. His case makes the 27th which has been recorded. The rarity of these abscesses in children is shown by the statistics of Rouis in Algiers, who had only 1 case in a child in 250 cases of abscess. In 9 cases injury was supposed to have been the cause, although this was not proved to have been the fact. The author's case died in spite of operation.

Abscess of the Liver.—Hermes[3] furnishes a contribution to the surgery of the liver, and reports 4 cases of abscess of the liver, 2 of which were previously reported by Sonnenburg. He also reports 2 cases of stone in the common duct, and 1 case of enormous thickening of the walls of the gall-bladder. In 1 case the abscess arose in the liver some months after an attack of appendicitis. It is absolutely certain that purulent appendicular disease is liable to give rise to abscess of the right hepatic lobe. This is an argument in favor of the removal of the appendix. In a case cited by Hermes abscess developed a few months after a perityphlitis. This is not the usual rule, as secondary abscess after appendicitis usually presents multiple foci of suppuration in the liver. Fränkel's diplococci were found in the pus. The 2d case of liver-abscess was due to gall-stones. The author considers exploratory openings into the liver and gall-bladder as dangerous, in that they may give rise to septic peritonitis. Of course if the liver is adherent to the abdominal walls it is the easiest thing in the world, and one of the safest, to open the abscess, but if there are no adhesions, the abdominal cavity must be shut off by the use of iodoform-packing until adhesions form. In his first case of stone in the ductus choledochus he broke the stone up by the finger and

[1] Lancet, Nov. 9, 1895.

[2] Va. Med. Monthly, No. 7, 1895.

[3] Deutsch. Zeit. f. Chir., No. 6, 1896.

pushed it into the duodenum. This is a procedure to be always tried, and which will be successful if the stone is soft and if the walls of the ductus choledochus show a fair amount of resistance. If we are unable to break up the stone, we may open the gall-bladder or directly cut the duct, remove the stones, and suture the wound. This was done in his 2d case, which died. Here the duct, enormously dilated, was supposed to be the gall-bladder, and the mistake was discovered on the postmortem table. This patient died because of hemorrhagic diathesis, which is a fearful and not unusual complication of grave icterus.

Fenger's article upon "**Stones in the Common Duct,** and their Surgical Treatment"[1] is a masterly production worthy of careful study. The medical aspects of this important paper are reviewed in another section by Drs. Pepper and Stengel (p. 181). Fenger reports 6 cases, and gives in detail the treatment of each one.

He tells us when attempting to outline the field of operation for the common duct we must remember we are dealing, not with a normal, but with a dilated duct. He uses a specimen to explain the relation of the structures in the hilus of the liver, and says the conditions about to be described are those generally found. The organ is described as in the position in which operations are made (patient upon his back and anterior border held up until its position is almost vertical). The vessels, bile-passages, and duodenum of the specimen were injected with colored paraffin. He describes the anatomical relations in detail, and then discusses the operation. The operation is explained at length, and every surgeon ought to make a study of this paper.

Magill of Paris and Jourdan of Marseilles[2] make an elaborate study of **choledochotomy,** considering in detail the reported cases and discussing the different methods of procedure in operations for gall-stone, and concluding with general considerations, an estimate of the mortality, and an elaborate explanation of the operative technic. In 72 cases of choledochotomy there were 50 recoveries, a mortality of 30.55%. Operations done in extremis and cases in which the death was due obviously to the loss of function of the liver should not be placed in the statistical table, and if these cases are deducted the mortality is reduced to about 20%, which represents the actual operative loss. This estimate, however, includes deaths from such accidents as greater familiarity with the operation and care which can be taken when forewarned will enable future operators to avoid. A mortality of much less than 20% can with safety be expected from this operation in future. Every incision of the anterior abdominal wall that could expose the liver-ducts has been used by some one for this operation. The incision most frequently employed is the vertical one upon the left border of the right rectus. Some operators have made a median incision, obliquely curved and parallel to the costal arch. Others have used a transverse incision, others various incisions. The vertical incision on the external border of the right rectus itself exposes the gall-bladder in its normal position, but the common duct lies nearer to the middle

[1] Am. Jour. Med. Sci., Feb., 1896.

[2] Internat. Med. Mag., Apr., 1896.

line. The oblique transverse incision parallel to the edge of the liver exposes both the gall-bladder and the common duct, but it has the great disadvantage of cutting the abdominal muscles transversely, rendering the subject liable to hernia in the future.

In some cases, through an error of diagnosis, the gall-bladder has been brought through the lumbar incision. This incision is extremely inconvenient, and gives access to the retroduodenal and pancreatic portion of the common duct alone. The fact alone that we find it necessary to always examine the gall-bladder and the bile-ducts renders this incision absolutely inappropriate. The T-incision gives easy access to the lower surface of the liver, but there is danger of subsequent hernia. In case of need a transverse section of the rectus may be added to the vertical incision, but at the beginning of the operation it is best to employ only a long vertical incision, either median or lateral. The median incision from the ensiform cartilage to the umbilicus corresponds to the anatomical position of the common duct, and it allows deeper access to the lower surface of the liver; hence an intervention limited to the common duct would make a median incision preferable, but the operation under ordinary circumstances is performed for chronic jaundice attributed to stone, but with no indication as to whether we shall be obliged to operate on the gall-bladder, upon the common duct, or upon both. Therefore the authors decide in favor of the vertical incision on the outer border of the right rectus, descending from the costal arch for a distance of 12 to 15 cm., and if this incision is found to be too small, a transverse section of the rectus may be added to it. They then discuss the treatment of adhesions, which are very commonly extensive in gall-stone disease, the bladder being apt to adhere to the colon and duodenum and sometimes to the stomach; there is constant adhesion between the liver and the omentum and transverse colon, which must be separated first. Finding the notch in the edge of the liver points to the probable site of the gall-bladder. Liberation of the structures should be accomplished by the finger, aided, it may be, by the knife and scissors. We should take great care not to open the colon, duodenum, or stomach—not to cut unexpectedly any fistula existing between the bile-passages and the other viscera. Surgeons should always remember that the vermiform appendix may be found abnormally in this position.

The first effort is now made to find and examine the common duct. The edge of the liver, protected by a sterilized towel, is lifted with a spreader in the hands of an assistant at the left of the operator, while a second assistant, opposite, having covered the stomach and intestines with sterilized towels, with the right hand pulls the stomach to the left, at the same time depressing the intestines with the other hand. The inclined plane position here enables the surgeon to see much better. The surgeon then places his left fore finger on the gall-bladder and the cystic canal, descends to and enters the foramen of Winslow, and hooks the right border of the gastrohepatic omentum, the common duct, the vena porta, the hepatic artery and ganglia, all of which the finger draws downward and forward. The thumb of the same hand, or more

conveniently the right fore finger, then follows from the anterior surface of the pedicle of the liver, examining carefully all the mass from the liver to the duodenum, the hepatic duct, the mouth of the cystic duct, and the supraduodenal part of the common duct. This methodical palpation will almost certainly detect any stone which may be present. To complete the examination of the common duct, search for stone in the retroduodenal and pancreatic portions, which is also done by digital palpation. The left fore finger is withdrawn from the foramen of Winslow, passed to the right of, and, as far as its mobility allows, behind, the duodenum, which it compresses as much as possible to approach the common duct. The left thumb or the other fore finger then compresses the parts against the posterior digit, and in this way explores for stone behind the duodenum and pancreas. We must not mix up a calculus with ganglia which exist in this region. For surgical considerations the common duct is divided into 2 parts—the 1, supraduodenal, A, attainable above the duodenum; the other, B, situated behind the duodenum and pancreas. Most calculi will be found in the first portion. This part is exposed by drawing down the duodenum, and corresponds to the right border of the gastrohepatic omentum a little below and in front of the foramen of Winslow. The vena porta lies to the left and behind the common duct, while to the left and in front of the vena porta lies the hepatic artery, from which the right gastroomental passes downward behind the first part of the duodenum. This portion of the duct is frequently crossed in front by large veins which may be injured.

"The common duct, in its normal condition a small canal of 5 to 6 mm. caliber, closely following the vena porta, differs widely from the duct; in cases of calculus stenosis, in which the biliary retention has almost invariably produced a large dilatation of the duct, its walls are usually thickened. The situation of the stone well determined, and the other viscera drawn aside and protected by aseptic towels from any possible contamination from the gall, the incision of the common duct is made longitudinally, but directly upon the calculus, which is the only guide for the cut. For this maneuver the left hand plays an important part, being introduced by the foramen of Winslow, passed behind the common duct, which it holds fixedly, and at the same time pressing forward the contained stone, assuring its immobility. Sometimes, however, the mass of adhesions allows the insertion of only the left fore finger to fix the stone, while the knife cuts the wall of the duct. The incision is often followed by a more or less severe hemorrhage of venous origin, rapidly stopped by compression. The edges of the incision may be maintained open by pressure-forceps, or by loops of thread such as Lauenstein places in the walls of the duct before its incision, which serve him later for a complementary suture.

"The extraction of the stone through the cut must sometimes be aided by a director or curet in order to detach the adhesions of the calculus to the wall of the duct. Sometimes even crushing must be resorted to, and the extraction be accomplished by the removal of the pieces. By the same incision other calculi, included and movable in the duct, can also be extracted."

The authors discuss the stones in the common duct, in the retroduodenal and pancreatic portions of the common duct, catheterization of the common duct and suture of its incision, drainage, suture of the abdominal wound, dressings, and results. Of results they speak as follows:

"*Post-operatory Results.*—A choledochotomy without complication generally gives a rapid, uneventful recovery. A few days after the operation a slight flow of bile from the drain may be observed, which either ceases almost immediately or results in a biliary fistula, closing some weeks later. The stools of the patient are found normally colored by the biliary secretions almost immediately after the operation. The jaundice disappears rapidly, but the liver may long remain of increased volume. If the operation is followed by a cholecystostomy, it is remarkable to see how soon the flow of the bile from the open gall-bladder ceases with the reestablished permeability of the common duct.

"The calculous tendency requires dietary precautions that should be indicated for the patient's future guidance.

"*Permanent Results of Successful Operations.*—As is usual for this heading, the lack of details to be obtained for its study is deplorable. Of the 72 clinical histories, only 27 follow the patient beyond the recovery from the operation. Küster (Case IV.) mentions the reappearance of heptic colic 5 months after the choledochotomy—colic which a cure at Carlsbad, the next year, relieved by the evacuation of 2 calculi. It will be noted in this case that the nondilated gall-bladder was not opened during the operation, and it may be possible that here were hidden the small concretions which may have formed the nuclei of the stones subsequently eliminated; 26 patients were reexamined after the choledochotomy, 7 within the first 6 months, 6 between 6 months and 1 year, 4 at the end of 1 year, 1 after 15 months, 1 16 months, 2 18 months, 2 20 months, 2 21 months, 1 3 years, and 1 4 years after the choledochotomy, and in all the recovery is noted as complete and permanent."

Elliot[1] commends **immediate suture of the gall-ducts** after extraction of stone. He gives a series of cases. He believes that the operations of cholecystotomy and cholecystenterostomy have become too much routine practice, and he strongly believes that incision of either the ducts or the bladder should be followed in the majority of cases by immediate suture. He has performed 5 such operations—1 on the hepatic duct, 1 on the common duct, and 3 on the gall-bladder. All have been successful. He reports these cases in detail. He says that a few years ago cholecystotomy was considered a satisfactory operation and Tait's success was considered wonderful, but we now find that immediate suture of the gall-bladder is quite as safe, frequently more satisfactory. Heussner has done this operation 13 times with good results; Körte reports 5 cases which have recovered; Abbe, Richardson, and others have reported successful cases. In late years it has been rare to find a report of a bad result from leakage. In fact, there seems to be very little real danger of this accident when the common duct is clear and the walls of the gall-bladder are moderately healthy, and it is only in such cases that we should employ immediate suture. Langenbuch believed that gall-stones were formed in the gall-bladder, and he suggested the operation of cholecystectomy for the radical cure of the formation of gall-stones. We now know that the nuclei of stones are formed in the liver, and therefore cholecystectomy is not a radical cure for lithiasis, and is only applicable to cases of malignant disease or of a very severe inflammation of the gall-bladder, or when the cystic duct is irremediably closed. Stones in the cystic duct have usually been removed by forceps through the gall-bladder, but there is always danger of forcing the

[1] Ann. of Surg., July, 1895.

stone into the common duct, and there are cases on record in which the stone has been forced into the hepatic duct and never recovered. In some cases pushing the stone up by squeezing the duct with the hand or with forceps through the gall-bladder has been successful. Incision of the duct is greatly preferable to prolonged manipulation with either hands or forceps.

Kehr reported 7 cases in which he incised the cystic duct, removed impacted calculi, closed the duct with sutures, and did at the same time cholecystotomy for drainage of the duct as well as to prevent back-pressure of bile. If stones in the hepatic or common ducts are small or soft, they should be crushed between the thumb and fore finger or be pushed into the duodenum and back into the bladder. Breaking up a stone with a needle or with padded forceps has been done successfully, but it is a method which might seriously injure the duct. It is necessary to employ this method, however, when the duct cannot be raised enough to employ sutures.

Elliot gives a resume of the cases in which stones have been removed by suture of the cystic duct. Including Elliot's own cases, there are 21 cases with 5 deaths, and including Kehr's cases of suture of the cystic duct, there are 28 cases, making a mortality of less than 18%. In 5 of the cases bile leaked through the stitches, but only 1 of these died. Gauze drainage was used in all of the cases but 3.

[Küster, Rehn, and Marcy closed the abdomen without drainage, with recoveries, but Küster had leakage of bile from the abdominal wound. In 7 cases the gall-bladder was left open 6 times by a cholecystotomy and once by a cholecystenterostomy. The operation of cholecystenterostomy has been done altogether too frequently of late. The invention of the Murphy button has enabled surgeons to greatly reduce the mortality of this operation, and as a result we have largely lost sight of the main purpose of the operation, which is to restore the ducts to their normal condition. In many of these cases that have been reported no attempt was made to remove the stones, and the ducts were not even examined. Stones in the duct when left untouched, even when the pressure of bile is removed, continue to cause cholangitis. They may cause processes of ulceration. Some of the stones loosen and come out, but, on the other hand, they are often impacted and held by cicatricial stricture. If the stone should loosen and come away and leave the ducts clear, it is much better that the patient should not be left with the gall-bladder opening into the intestines, as there is then greater danger of intestinal bacteria infecting the liver. The operation of cholecystenterostomy should be limited entirely to cases in which there is an irremediable stricture of the common duct. In all cases where the duct has been incised and cannot be sewed or is imperfectly sewed, or where the stitches are found to cut because of the friable condition of the duct, a cholecystotomy ought to be joined with an operation upon the duct in order to prevent distention with the bile. Cholecystotomy should always be done when the condition of the bile-passages indicates the necessity for drainage, as in empyema of the gall-bladder and in suppurating cholangitis. Nevertheless, in ordinary conditions due to obstruction recovery without drain-

age is prompt. In those cases in which a person with gall-stones is in a critical condition it is often wise to do a preliminary cholecystotomy.]

Barker[1] presented the records of 3 cases of **operation upon the gall-bladder for stone.** In the first 2 cases the stones were removed with the greatest possible ease. Case 3 exhibited a not unusual difficulty—that is, when the gall-bladder lies deep and is immovable, and it is difficult or impossible to lift it up into the abdominal wound. Barker says in such circumstances pack iodoform-gauze around the swelling before incising it, and if the bladder will not come up to the peritoneum, the peritoneum itself must be stripped from the rectus sheath, pressed down to the gall-bladder, and stitched to it, as advised by Mayo Robson. But even this is insufficient to shut off the peritoneum in some cases. In such cases he follows the method of Robson and draws the omentum into the opening remaining, and stitches it there to close it. He believes in the method of drainage employed by Körte of Berlin. A piece of drainage-tube is inserted into the gall-bladder, the opening in which is sutured to the tube. The wound is closed around the drainage-tube and covered with gauze, and the projecting portion of the tube is united by means of a bit of glass tube with a long rubber tube which terminates in a feeding bottle by the patient's side. This mode of drainage keeps the dressings free from bile and obviates the necessity for frequent change. So soon as the bowels act and we find that the motions contain the normal amount of bile, the tube to the gall-bladder may be removed, and the biliary fistula will not usually result. [Cathcart's siphon drain might be used with advantage in these cases.]

Morison[2] reports a series of cases of **gallstone operation** done by a method which he has suggested. He maintains that it is absolutely necessary in such operations to drain a peritoneal pouch which he was the first to describe. This pouch is found beneath the right hepatic lobe, and is separated by natural barriers from the remainder of the peritoneal cavity. He says that this pouch can be efficiently drained through an opening into the abdominal wall near the lower end of the kidney, and he prefers the transverse incision to the vertical incision in operating for gall-stones. It gives better access and is less liable to be followed by ventral hernia. He does not suture the gall-bladder to the abdominal wound, except in special cases. It is liable to empty into the pouch, but this does not matter if the pouch is efficiently drained. When the gall-bladder has been closed by sutures and returned into position, a drain is left in this pouch until the surgeon is sure that the wound in the gall-bladder has united. When the gall-bladder is returned without suturing we simply drain this pouch. The author strongly believes in the removal of stone from the cystic duct by incision of the duct. [Morison's original paper describing this pouch will be found in the Brit. Med. Jour., Nov. 3, 1894. It is often a problem in the mind of a surgeon to determine whether a case of cholelithiasis should be treated medically or surgically. Gersuny has laid down the following indications for operation:

[1] Lancet, Jan. 25, 1896.

[2] Ann. of Surg., Aug., 1895.

When there is danger of rupture of the gall-bladder; when there is beginning sepsis; when there is intestinal obstruction; when the attacks of colic are frequent; when jaundice is persistent; when pain is constant and the patient cannot follow his occupation.[1] Alexander Ferguson in commenting upon Gersuny's rules[2] says the surgeon should also make the following inquiry: When should we open the abdomen to explore the gall-bladder? He thinks this should be done—1. When, after an attack of colic, a distended bladder suddenly diminishes in size, with relief of pain, but without stones in the stools, and with tenderness remaining over the gall-bladder (this means that a stone was wedged in the cystic duct, but has fallen back into the bladder). 2. For jaundice following colic. 3. When tenderness persists. 4. When marked enlargement persists. We do not think it advisable to persist long in medical treatment. After a careful trial, if improvement is not noted, operation should be performed. To delay operation opens the patient to the dangers of perforation, suppuration, and, Mermann says, cancer. The best operation is immediate suture of the bladder, but this is not safe if the contents of the viscus are septic.]

Terrier[3] in a paper upon "**The Treatment of Angeiocholitis and Cholecystitis of Infectious Origin**" reviews the different plans of treatment which have been suggested. He tells us that if the biliary ducts are inflamed, whether calculi exist or not, and the patient has attacks of fever, either continuous or remittent, celiotomy must be performed, this celiotomy having for its purpose the incision of the gall-bladder and the making of a biliary fistula. This operation enables the surgeon to explore and gives thorough drainage to the septic bile and free exit for the bile products, and permits, in a certain indirect and mechanical manner, the disinfection of the bile-ducts. [Block's method of cholecystotomy is a safe one when the above conditions exist. It obviates the danger of septic peritonitis, and does not favor the anchoring of the bladder by dense adhesions which would be a trouble in subsequently closing the fistula. Block performs extraabdominal cholecystotomy. He opens the belly, draws the gall-bladder through the wound, and fastens a portion about as large as a hen's egg outside of the belly-wound. When the peritoneal cavity becomes well guarded by adhesions the gall-bladder is opened. It is sutured at once if protracted drainage is not needed and after union occurs. The viscus is separated from the belly-wound, and is dropped back into the abdomen. (See Rev. de Chir., Feb., 1895.)]

Ferguson[4] says that **biliary fistula** frequently follows operations upon the gall-bladder because surgeons stitch the gall-bladder directly to the skin, and thus secure a mucocutaneous tract which is very difficult to heal. Another operative cause is that the gall-bladder is occasionally sutured to the lower angle of the abdominal wound. The most dangerous cause of biliary fistula is the obstruction of the cystic or the common duct by gall-stones or by stricture. The treatment of biliary fistula is preventive and curative.

[1] Wien. med. Presse, No. 47, 1894.
[2] North Am. Pract., July, 1895.
[3] Rev. de Chir., Dec., 1895.
[4] Chicago Med. Rec., Sept., 1895.

When the surgeon performs a cholecystotomy and the ducts are found patulous or if they were obstructed by calculi, the calculi are removed and permanent fistula is prevented by suturing the incised gall-bladder to the peritoneum alone at the upper angle of the wound. It must not be sutured to the skin. When it is sutured to the peritoneum alone it leaves the organ within the abdomen in the best possible position for closure. When we come to treat an existing fistula we should perform a plastic operation, making incision through the skin and through tissues about the fistula down to, but not through, the peritoneum. The abdominal cavity is not opened. The mucous tract is amputated and the gall-bladder is closed with 2 rows of catgut suture, the first row of interrupted sutures to coaptate the mucous membrane and check hemorrhage, and the second row of inversion sutures inverts the first row. When this has been done it will be found that the gall-bladder recedes into the abdomen to an astonishing degree. The operation is completed by closing the abdomen in the usual manner. Ferguson then cites a successful case in which he did a plastic operation for a biliary fistula which followed a cholecystotomy. He has been able to collect only 14 cases, besides his own, where attempts were made to close biliary fistulæ by operation, and he appends a statistical table containing them.

GENERAL OBSERVATIONS CONCERNING ABDOMINAL SURGERY.

Treves[1] writes on the treatment of **Glenard's disease by abdominal section.** This disorder, known as abdominal ptosis, visceroptosis, or Glenard's disease, was first described by Glenard of Lyons in 1885. It depends upon a relaxation of the abdominal wall and of the supporting ligaments of the viscera, as the result of which the organs drop to a lower level in the abdomen. The affection is most common in women. There is no definitely assigned cause, though repeated pregnancies, overexertion, and injury may all play a part. The first part to descend is the right band of the transverse colon; then the stomach is drawn down, with the result that the pyloric opening is compressed and the passage of food is hindered. In course of time the rest of the transverse colon descends. The orifice between the duodenum and jejunum is narrowed, and a further obstruction is offered to the passage of intestinal contents. The entire mass of the small intestine prolapses; the lower part of the abdomen is seen to be prominent or even patulous, while the upper part is flattened. The liver and kidney become loose and floating. The symptoms are many and distressing. There is general ill health, general depression, asthenia; the patient becomes a chronic invalid, is unable to take exertion, and is only comfortable when recumbent. There is a sense of weight and dragging in the abdomen, pain in the back and continued weariness, burning in the region of the stomach, vomiting, pain, loss of appetite, distress after eating, and more or less dyspepsia. The bowels are irregular, and there is occasionally diarrhea, but as a rule constipation exists. Bowel-

[1] Brit. Med. Jour., Jan. 4, 1896.

movements are productive of pain. Laxatives cause distress, and relief is sought by enemata. The stomach and intestines are usually dilated, and a sense of pressure on the bladder is frequently complained of. The symptoms which we assign to movable kidney are very commonly present. Colic is common, and may be acute. In so-called neurotic subjects these symptoms are greatly intensified, and the condition is engendered which is called neurasthenia. The symptoms are relieved by pressure upon the lower abdomen with the two hands or by wearing a supporting belt. Many patients cannot move about at all until they have adjusted their supports. Physical signs need not be dwelt upon. The liver and the stomach are prolapsed, and return more or less to their normal position when the patient is recumbent. Mr. Treves cites a case of this disease in a young woman in whom he thinks that the course of events was as follows: Tuberculous ulceration of the bowel, followed by tuberculous gland disease, with adhesion of the omentum and gradual dragging upon the stomach and the transvere colon. He says it would be interesting to know if in other instances of Glenard's disease there is an actual causative lesion as in the present instance. This condition of visceral ptosis may be more common than is supposed, because the examinations of the abdominal organs are usually made upon patients in recumbency, and upon patients in recumbency it is difficult to say whether abdominal ptosis exists or not. It would be desirable to ascertain if the mere dropping down of the viscera must of necessity lead to a distressing train of symptoms, or if the patient can have this dropping down and yet have no distressing symptom whatever. We know that some people with movable kidney may be unconscious of it and remain in perfect health. Treves then discusses the question of intestinal neuroses, and reports 2 cases which were purely neurotic cured by abdominal section. In regard to 1 of these patients, who complained of contractions and dilatations of the bowel, Treves mentions the varying condition of the colon when it is placed in front of a large renal tumor. In such cases the colon may be contracted and the condition comparable to a solid growth. It may be dull on percussion, yet before the examination is completed we may find the bowel dilate and give a tympanitic percussion note. Ballooning of the rectum depends upon disturbance in its nerve-apparatus. The dilatation of the gut is not produced by distention with gas; the introduction of the finger or a tube does not cause it to disappear. It may vanish after continued manipulation, and disappears under an anesthetic. It is vaguely associated with some trouble higher up in the canal, usually in the colon, not uncommonly stricture of the colon. It is sometimes very marked in appendicitis and after abdominal operations involving the bowel. Surgery affords many illustrations of that curious transmigration of pain which is common in abdominal troubles and which may play a part in intestinal neuroses. In acute trouble with a small intestine, as, for instance, in strangulated hernia, pain is referred to the root of the superior mesenteric plexus. Renal pain is frequently experienced over the outer side of the hip or thigh and in the heel or sole of the foot. In stone in the kidney the pain may be referred

to the opposite organ. In appendicitis the pain in certain stages may be referred to the opposite side. In one instance pressure upon a diseased appendix during an interval produced pain in the corresponding point of the left iliac fossa. Curious colicky pains in the bowel appear to vanish mysteriously after operations which have rid the patient of some disease of the gall-bladder, kidney, or ovary.

DISEASES OF THE RECTUM AND ANUS.

Allingham[1] considers the question of treatment, operative or palliative, in **carcinoma of the rectum.** During the last 8 years he has seen 720 cases of cancer of the rectum; he has performed excision 62 and colotomy 138 times. He has been led to classify the cases according to the line of action which seems to him proper. In arriving at this classification he bears in mind the following points: 1. The age of the patient; 2. The location and extent of the growth; 3. The nature of the symptoms. Is there obstruction of the bowels? Is there constant diarrhea? Is there hemorrhage, or is there pain? This classification enables him to divide cancers into those cases fitted for excision, those cases fitted for colotomy, and those cases fitted for palliative treatment. If the patient is not over 45 years of age, excision offers very little prospect of permanent success.

The Modern Operative Treatment of Cancer of the Rectum is elaborately reviewed by Gerster,[2] who states that comparatively recent revolution in the methods of surgical treatment of cancer of the rectum is based upon an accidental observation which Volkmann made in 1863. He was removing a periosteal sarcoma and accidentally opened the sacral canal. This accident had long been regarded by surgeons as a very grave one, but Volkmann found that the patient exhibited no serious damage and promptly recovered. Kraske was at this time Volkmann's assistant, and he made a study of sacral injuries, and in 1885 published his conclusions. It is true that in 1874, Kocher removed the coccyx as a preliminary step to removing the rectum, but the importance of this device of Kocher's is not comparable to Kraske's excision of the left half of the lower portion of the sacrum up to the third sacral foramen. Purely anatomic considerations served to encourage surgeons to cultivate this field, and we now see a most remarkable extension of the legitimate indications for surgical interference with rectal neoplasms, but especially a great improvement in the mortality rate, which has descended from the 57% of Iversen to the 20% of Krönlein. The number of colotomies done as a palliative measure has steadily diminished until now it is practically confined to hopeless cases or when internal deposits complicate a removable tumor. We have learned that success very largely depends upon a careful application of asepsis; hence when there is considerable constriction a thorough evacuation of the gut, and hence thorough cleansing, is impossible, and preliminary colotomy is done to enable us to get rid of the fecal matter which is impacted above the stricture. The removal of this fecal mass lessens inflammatory

[1] Lancet, Apr. 25, 1896.

[2] Ann. of Surg., Oct., 1895.

changes, renders the subsequent operation less bloody, and procures freedom from septic fever. Schede and Kammerer think that a preliminary colotomy should be invariably performed. Gerster does not go quite this far. He thinks it is indicated when a satisfactory cleaning of the large gut is rendered impossible or even difficult by whatever cause. The method of colotomy universally advisable is the inguinal one, usually upon the left side. When there is extensive disease with a naturally short mesocolon, it may be necessary to locate the colotomy-wound in the right side of the abdominal walls, as this would not interfere with the bringing down of the stump of the rectum. After extirpation has been successfully accomplished the stump artificially opened is to be closed. Gerster then reviews some of the modifications and improvements of Kraske's plan, and presents all the possible routes of attack upon rectal tumors. The paper itself will be found a very able and yet conservative estimate of the value of these measures.

Andrews[1] strongly disbelieves in the value of **Whitehead's operation for piles,** and writes a paper upon the disastrous results which follow its performance. The peculiar mechanism and important functions of the mucous membrane and submucous tissues of the rectum show that we are not dealing with a simple, smooth mechanical tube, but with a highly specialized organ which cannot be dissected out without doing great or even irreparable mischief? Andrews communicated with a large number of surgeons in Europe and America.

Paul[2] says that **excision of the rectum,** except in minor degree, has not been warmly advocated by surgical writers in England. Even Cripps out of an experience of 400 cases of rectal cancer has only operated upon 38, and appears to disapprove of the major operation. In connection with this subject, Treves does not even mention the name of Kraske or Alexander. Treves thinks that 3 in. is the limit beyond which excision is not advisable, and objects positively to the opening of the peritoneum. Jacobson strongly condemns the high operation, but Paul maintains and argues that the more extensive operations upon the rectum for cancer are in every way more hopeful than those performed for much less advanced disease in the mouth, which almost all surgeons would consider it their duty to perform, and he does not see why they should not equally consider it their duty to do the former operations.

Roux[3] employs the following plan in the **treatment of hemorrhoids:** The patient is placed in the lithotomy-posture and the surgeon's thumbs are carried into the rectum. The rectum is dilated, the thumbs coming in contact with the ischia. A syringe is filled with a 50 to 80% solution of carbolized glycerol, and the fluid is injected into each pile. During the injection the base of the hemorrhoid is held between the surgeon's thumb and index finger. The needle is entered near the anus and pushed through to the base of the pile. This maneuver prevents bleeding. Roux thinks that the dilatation really does more good than the injection.

[1] Mathew's Med. Quart., Oct., 1895. [2] Ibid. [3] Canad. Pract., Dec., 1895.

Morain[1] in speaking of the treatment of **anal pruritus** tells us to seek for the cause and endeavor to remove it. Hot external irrigations are of value, several times a day. Constipation is avoided by taking enemata of oil, and the anus can be rubbed with vaseline. In more obstinate cases he advises that the parts be painted night and morning with a mixture of 60 gr. of alum, 30 of calomel, and 300 of glycerol, or smeared with an ointment containing 60 gr. of calomel, 450 of vaselin, $\frac{1}{20}$ of a part of oleate of cocain, 3 parts of lanoline, 2 parts each of vaseline and olive oil. Another valuable ointment is composed of 60 gr. of red oxid of mercury with 450 of vaseline. Relief is given by inserting a tampon saturated with a 4 in 30 solution of zinc oxid to the anal orifice, or the region may be touched with a 1 in 10 solution of silver nitrate. In very severe cases he uses the galvanocautery or employs scarification.

Van der Willigen[2] considers **ichthyol** as the most valuable drug in the treatment of **anal fissure.** He impregnates a brush with the pure drug, and thus introduces it into the anus, and the contraction of the sphincter muscle forces it into all the folds of the mucous membrane. This treatment is assisted when necessary with castor oil. The results in a number of cases have been most excellent.

Hartmann and Toupet[3] have written an article in La Semaine médicale upon **syphilitic stricture of the rectum.** They state that in stricture of the rectum we find syphilis and tuberculosis very frequently in the history, but that there are many persons who display no evidence of either of these infections. There is usually found marked thickening of the submucous coat, which is transformed into a fibrous mass which may be confused with the mucous membrane and those of the muscular tunic. The mucous membrane is altered, but very rarely ulcerated. Again, in certain parts well-marked tuberculous lesions may be found, and at times well-marked syphilitic lesions may appear, but they are not found in all those who have a specific history. These structures are really inflammatory, and the syphilitic lesion, if it exist at the onset, has only acted in opening the way to infection and in permitting a benign inflammatory process to develop in the rectum. It will be thus seen that in nearly all the cases of stricture of the rectum we are dealing with a stenosing rectitis, and that syphilis and tuberculosis, even if they do exist, which is not always a constant condition, only act by permitting infectious processes to penetrate the mucous membrane.

DISEASES OF THE RESPIRATORY ORGANS.

Pagenstecher[4] presents the subject of **hemothorax,** studied clinically and experimentally, and he has arrived at the conclusion that blood in the pleural sac does not coagulate, because the endothelium of the pleura preserves it as does the endothelium of blood-vessels. Clots do occasionally form,

[1] Rev. Internat. de Méd., July, 1895.
[2] Monatsh. f. prakt. Dermat., 1895.
[3] Jour. Cutan. and Genito-urinary Dis., Aug., 1895.
[4] Beiträge z. klin. Chir., xiii. No. 1, 1895.

especially if the pleura itself has been injured, but these clots resemble rather thrombi than ordinary coagula. In case of pneumothorax with healthy pleura the blood will be entirely absorbed in a couple of weeks. If pleurisy arises, it is due to some other factor, as the presence of blood alone will not produce it. As he considers that intrapleural pressure is insufficient to stop bleeding, he does not object to aspiration if it is otherwise indicated. He has but little hope of controlling hemorrhage by opening the chest. [The Société de Chirurgie of Paris debated the subject of pulmonary surgery in November of 1895, and most of the speakers maintained that in wounds of the pleura, when bleeding does not cease spontaneously, the surgeon should enlarge the wound, look for the bleeding vessel, and tie it. In wounds of the chest the surgeon of course determines at once whether the source of bleeding is an intercostal vessel, and if he finds an intercostal vessel to be the source, he resects a rib and ties the vessel. Most surgeons hold that operation is unjustifiable if it seems probable that bleeding has ceased—at least is unjustifiable in such a case unless suppuration occurs, in which condition operation is mandatory. In some cases of hemorrhage a cavity may be packed with iodoform-gauze. Tuffier maintains that a rise of temperature is not a proof of septic infection, and that before operating for supposed sepsis a surgeon should first aspirate and note the nature of the fluid withdrawn. Lucas-Championnière asserts that surgeons are often in too much of a hurry to operate upon cases of hemothorax, as most cases will recover when the side is given rest by immobilization. The Therapeutic Gazette[1] gives a lucid summary of the views which are at present held by many leading surgeons.]

Péan[2] in a recent address upon **the surgery of the lung** gave the results of his own experience, and sets forth the opinions that may reasonably be drawn from a study of the numerous recent papers. He tells us that the surgery of the lung has of late progressed to a great degree because of the advance in anatomic knowledge and the improvement in procedures for the arrest of hemorrhage. The wounds caused by blunt bodies, by sharp instruments, and by small or medium-sized bullets usually heal very well without causing suppuration or grave reaction, the dangers which arise from such injuries being due less to damage of the pulmonary structure than to the number and extent of the wounds and the damage to important neighboring parts. The surgeon must not be in haste to intervene in these injuries, must not be in haste even to make a simple exploration or to attempt to remove a bullet which can be seen near the surface. Large projectiles, such as shell-fragments, give rise to very severe injuries—injuries in which it is usually impossible to save life even by suturing together the two layers of the pleura. A certain number, though but few, spontaneous affections of the lungs are treated successfully by surgical operation. Ordinary abscesses or gangrenous abscesses, when they are limited, when they endanger life, and when they do not progress toward cure by medical treatment, should be treated surgically, and in such cases the results are very generally favorable. When tuberculous

[1] Apr. 15, 1896.

[2] Presse méd., Oct. 23, 1895.

abscesses of the lung cause severe pain, or have established fistulæ, or have taken on widespread pleural adhesions, they should be opened, drained, and even cauterized, and in these cases it is often useful to partially resect one or more of the ribs. The removal of fragments of lung-tissue surrounding tuberculous cavities is perfectly useless, as bacilli have invaded the structure far beyond the apparent disease. In hydatid cysts of the lungs incisions should be practised, and if adhesions do not exist the surgeon should establish adhesions between the parietal and visceral pleura to enable him to wash out the cavity thoroughly. Solid lung-tumors can be removed when superficial, but opportunities to perform these operations will be very infrequent, as lung-tumors are almost invariably secondary. [Injuries of the lung are among the most serious calamities confronting a surgeon. They are highly dangerous, and yet interference seems justifiable only within rather narrow limits. The peculiar structure, the natural activity, and the vital functions of the lung set it as an organ somewhat apart from surgical dogmatizing. Some years ago the extirpation of apices infiltrated with tubercle was looked upon as a promising procedure, but it is now abandoned, and abandoned practically by universal consent. Some few attempts have been made to arrest bleeding from damaged lung. (See Delorme's case.) In most cases the bleeding pulmonary vessel is ligated; in some instances a cavity is packed with gauze. A foreign body in the pulmonary tissue should in some instances be removed, and an abscess should be evacuated. With the exception of cases of hemorrhage, cases with abscesses, and some cases with foreign bodies in the pulmonary tissue it is questionable if a surgeon should interfere by operation with lesions of the lung.]

Reclus[1] groups the **affections of the lung which demand operative interference** under three heads: 1. Hemorrhage, either traumatic or pathologic; 2. Tumors, such as cancer or tubercle, which demand pneumectomy; 3. Cavities filled with liquid or with putrid contents, such as tubercular cavities, bronchiectasis, abscesses, hydatid cysts, and gangrenous cavities which are local. Most of the second group of cases require simple incision or pneumectomy. Very few attempts have been made to arrest pulmonary hemorrhage by incision or ligation of the vessel or ligature of the lung itself. Cases have been related, notably by Omboni of Cremona and Delorme, but each patient died. Reclus is of the opinion, when rest, immobilization of the chest, and closure of the wound fail to limit the hemorrhage and death is threatened from syncope, from paralysis of the heart or diaphragm, or from the large amount of the blood in the pleural sac, that the thoracic wall should be incised, the bleeding lung exposed, and either ligatured or packed with iodoform-gauze. It is very rarely that pulmonary tumors can be removed surgically. The first attempt to excise the apex of the lung for tubercle was made by Block. The patient died, the coroner's jury condemned Block severely, and this unfortunate surgeon committed suicide. Since then 6 cases of excision have been placed upon

[1] Rev. de Thérap. Méd.-Chir., Nov. 1, 1895.

record, and of these 2 recovered. Reclus is of the opinion that this proceeding is altogether unjustifiable, because if the lesions are widely diffused the proceeding is too dangerous to be practised, while if it is limited to one apex there is a very fair prospect of cure by ordinary known surgical means. Extirpation for cancer is only justifiable if the tumor passes from the thoracic wall to the adjacent lung and is limited in extent. When the tumor starts in the lung-substance excision is absolutely impracticable, since if the growth is small the diagnosis is uncertain, and if the growth is large operation will be certainly fatal. The surgical treatment of cavities and cysts is more promising. Operation for tubercular cavities is of little use. It is true that there may be some benefit obtained by drainage, yet the original disease is not helped, and sometimes the operation proves fatal; 5% of patients who have been subjected to this operation have died directly from the operation, while 70% have died within 2 weeks and 15% within 4 weeks of it. In only 10% out of 100 reported cases was any real benefit derived, and even in these the disease ran its usual course, unaltered and unchecked. Operation in bronchiectasis has been very disappointing, because there is usually more than one cavity. There may be some improvement from the drainage of the one cavity, but systemic absorption will still take place from the others. Nevertheless, incision is recommended in cases in which dilatation is a prominent phenomena, while sepsis and high temperature are noted and cough and profuse discharge exhaust the patient. Operation for hydatid cyst is of most undoubted value. If these cases are not treated surgically, 54% die; if subjected to simple puncture, 27% die; if treated by incision, only 16% die. Pneumotomy is of very great value in gangrene of the lungs. The mortality after this operation is 25%, while the mortality in cases unoperated upon is 75%. The earlier the operation is done, the better of course is the prognosis, since late operations are done, as a rule, when the patient already has pyemia. Reclus says that the results are apt to be better after 40 years of age, and are worse in women and children than in men. He does not advise operation in every case. It is contraindicated in diffuse gangrene. It is unnecessary in the very limited gangrene in a young person with little constitutional involvement. When the cavity is large, though limited, when it fails to empty itself by cough, and when sepsis is beginning, operation must be done without waiting for serous adhesions to form between the two layers of the pleura. This adhesion makes the task of the surgeon easier, but he cannot afford to wait for its occurrence. In abscesses of the lung, especially in large abscesses of the lower lobe, operation should certainly be performed. Cases not operated on are very apt to die either from sepsis or from asphyxia from the passage of a great amount of pus into the tubes. Men and young people do better after this operation than women and old persons. Pneumonia is a common cause of death. The death-rate in 30 cases was 20%. The author concludes his paper by a presentation of the best operative methods. [The London Practitioner (Jan., 1896) has an excellent abstract of this paper, which abstract we have utilized. In open-

ing cavities Krause uses a thermocautery. This surgeon reports a recent case of gangrene cured by operation.[1]]

Tuffier[2] sets forth a new **method for exploring the lung surgically.** He showed in 1880 how the parietal pleura might be stripped off the thoracic wall in lung-hernia, and he practised the same method in a case of gangrene of the lung. In the latter case the patient was anesthetized and laid upon the left side with a cushion pushed under the flank. An incision in the 8th intercostal space of the right side was made, which incision was 4 inches long; the parietal layer of the pleura being exposed for the whole length of the incision, the lung was seen to move naturally under this outer layer and to look normal in color. The parietal pleura was then stripped from lower border of the 8th rib, from the upper border and from the inner surface, and 2 inches of the 8th rib were excised, and the parietal layer of the pleura was then stripped from the chest-wall over a space equal in size to that of the hand. This enabled Tuffier to explore the lung thoroughly. He found it when squeezed between the fingers to be soft and to be equal in consistency in different places, but in moving upward he discovered a hard portion absolutely different from the rest. Determining this to be the seat of the disease, he removed more of the posterior part of the 8th rib. He was now able to determine that the hard part was of a yellow color, and that the two layers of pleura were adherent above it. He packed the periphery of the wound with iodoform-gauze, incised the hard portion of the lung, and opened into a cavity the size of an orange from which flowed brown pus, clots, and pieces of lung tissue. The cavity was washed out and packed with iodoform-gauze, a piece of gauze was placed in the space between the chest-wall, and the parietal layer of the pleura and the rest of the wound was closed. The patient recovered. [A number of surgeons who debated the subject of pulmonary surgery at the Société de Chirurgie of Paris opposed Tuffier's method of detaching the pleura in operating for deep abscess, thinking that this detachment would be positively dangerous, as pus might gather in the cavity created by the detachment. It seems to us that in operating for abscess the surgeon should observe whether the parietal pleura and the visceral pleura are adherent over the abscess. If these two layers are found adherent, the operation may be at once carried out; but if they are found not to be adherent, they should be made so by stitching with catgut, and the operation should be deferred for several days to permit of union. Thus is pyothorax averted. In operating, the cavity should be found with an aspirator needle; when it is found it is opened with forceps or Paquelin's cautery; it is not irrigated, and it is drained by means of a rubber tube.]

Webb[3] reports a case of **abscess of the lung.** [His case shows the great danger of attempting to inject these cavities. Such an operation as outlined above is far more dangerous than incision; it is liable to be followed by pyothorax, and if bleeding happens an incision will probably be required before we can control it.]

[1] Berl. klin. Woch., 1895, p. 347. [2] Gaz. des Hôp., No. 135, 1895.

[3] Lancet, June 29, 1896.

Parmenter[1] considers the question of **contusion of the lungs** without wound of the walls of the chest and without rib-fracture or rib-dislocation. [The two previous papers show that in some cases it is proper to ligate the bleeding pulmonary vessel on the oozing lung-structure or to pack with gauze.]

Vallas[2] presents a paper on **Transhyoidean Pharyngotomy.** He holds that the pharyngotomy below the hyoid, as usually carried out for the removal of tumors above the epiglottis, has two objections: The transverse cut frequently involves the soft parts to too great an extent, and it also permits the wounding of important organs, especially a branch of the superior laryngeal nerves. [The operation of subhyoid pharyngotomy or of suprathyroid laryngotomy was originally suggested by the celebrated Malgaigne in 1835. This operation has been employed several times for the removal of growths of the epiglottis. An objection to this operation is the limited amount of room the operator is afforded for instrumental work after his incision has been made. This incision might be employed to gain access to a foreign body in the larynx or to an abscess in or near the base of the epiglottis. The elder Gross has told us that the only vessels of importance in this region are the superior laryngeal artery and vein, and they are in no danger of being wounded, as they run along the upper border of the thyroid cartilage. Gross advised that the knife be carried horizontally along the lower border of the hyoid bone.]

Perier[3] mentions 2 patients upon whom he did **laryngotomy without previous tracheotomy.** The operations were for the purpose of removing laryngeal papillomata. He sutured the wound completely. Both cases recovered without bad symptoms. [Laryngotomy has been frequently performed without previous tracheotomy, and Jacobson tells us that some operators even excise the larynx without previous tracheotomy. Treves advises preliminary tracheotomy if much hemorrhage is anticipated. The *Year-Book* for 1896 contains an article of Hislop (p. 336), who describes an extensive cut-throat in which he successfully sewed up the trachea. The paper of Perier and the report of Hislop should suggest whether we should not often seek to close wounds in the trachea and larynx and avoid the insertion of a tube.]

Morgan[4] in a clinical lecture presented a case in which a **foreign body** had been impacted **in the left bronchus** for 46 days, and in which operation was followed by recovery. The patient had been admitted under the care of Dr. Mitchell Bruce with a history that 3 weeks before, while sucking a plum-stone which had cracked, a portion of the stone had been, as was supposed, swallowed. It was decided to attempt to remove the body by operation. The patient was chloroformed, and Mr. Waterhouse made the incision for a low tracheotomy. The trachea was opened; no mucus escaped; a small amount of blood which entered the opening was expelled; the patient was inverted, with vigorous stimulus to the back, but the obstructing body was not loosened. A bent wire with looped extremity was passed down the left bronchus, but did not discover any obstacle. A strand of silver wire with

[1] Buffalo Med. Jour., Oct., 1895.
[2] Gaz. des Hôp., No. 7, 1896.
[3] Bull. l'Acad. de Méd., June 25, 1895.
[4] Lancet, Sept. 28, 1895.

double loop was then passed, and the object was distinctly felt. The laryngeal reflex was excited with a feather. The breathing became spasmodic and violent, but the foreign body was not expelled. A large tracheotomy-tube was then tied in, for which Barker's tube was afterward substituted. About 2 weeks afterward the child was again anesthetized, inversion was tried, and cough was excited by a feather passed down to the trachea. A long probe was then passed down the left bronchus, and a hard substance was felt $5\frac{1}{2}$ in. from the lower margin of the wound. The wound was held widely open by retractors; a pair of forceps was passed down the left bronchus, and the foreign body was successfully withdrawn. This was found to be nearly half of a plum-stone. The wound was left with only a guard wet with carbolic lotion. The patient made an uneventful recovery. The foreign body was apparently lodged at a point where the left bronchus bifurcates into its two main divisions and below the branch which passes to the upper portion of the left lung. [A medical man "stood the patient upon her head." This is a procedure, as Morgan well says, which is never to be carried out unless the physician is ready to do an instant tracheotomy, for instant tracheotomy may become necessary if the foreign body is dislodged. A remarkable feature of this case is that a large portion of the right lung was cut off from normal functional activity for 46 days, and yet the lung apparently sustained no serious damage. Foreign bodies lodge in the right bronchus far more often than in the left bronchus, because the right tube is the larger, and chiefly because the space between the two tubes is toward the left of the middle plane and tends to lead a body toward the right side. The elder Gross recorded a case in which the hull of a bean was drawn into the bronchus; gangrene of the lung began in $2\frac{1}{2}$ months, and the hull was expelled by coughing after many weeks. The chest over the left lung became permanently contracted.]

Cantley[1] in an article upon **the treatment of empyema** shows that empyemata may be absorbed, and this is especially true when they are caused by pneumococci; but to trust in nature is a risky procedure, because rupture may take place through the chest-wall and the presence of pus in the pleural cavity is an absolute indication for operation. The surgeon should endeavor to remove the pus, to prevent any reaccumulation of it, to secure expansion of the lung, and to minimize deformity. Aspiration is only a palliative procedure. The cannula very soon becomes blocked up and some fluid is certain to be left behind. To carry out the fluid with too great rapidity means danger of pulmonary rupture, and hence of pyopneumothorax or of pulmonary edema. Aspiration can be employed in very urgent cases, and in cases of effusion on both sides as a temporary measure, and in cases where the fluid is seropurulent. Some cases do recover under this plan of treatment, but they are few and the risks are considerable.

Cantley prefers incision and drainage to resection of a rib or a portion of a rib. He says that it is very rarely in a child that we are not able to drain thoroughly through the intercostal space—that rib-resection causes more shock

[1] Arch. of Ped., Mar., 1895.

and does not render recovery more speedy. He says that resection in children under the age of 3 shows a vastly greater mortality than does intercostal incision. Another consideration is that opening the medullary cavity of the rib renders the patient liable to pyemia. It is unnecessary to break down adhesions in the cavity, and unnecessary even to explore it. Resection is only employed in those cases in which the ribs are situated in close proximity or as a secondary operation to close a sinus. If drainage is found imperfect after simple incision, resection may then be practised. The tube which we drain with should not be over 2 in. long. A long tube is useless, as we seek cure not by the production of granulations to fill the cavity, but by expansion of the lung, ascent of the diaphragm, and contraction of the side. Since the discharge becomes serous and scanty, the tube ought to be removed, and this may often be done on the third day. To leave it in longer is to keep up continued irritation, which causes the continuance of the discharge. [We are in agreement with the author as to the uselessness of aspiration as a curative procedure, and are not in agreement with him as to the risks of rib-resection. We think he greatly exaggerates the risk of the latter procedure. Resection of a rib or of several ribs may be necessary for drainage, because intercostal drainage is often unsatisfactory, and it may be necessary to permit contraction of the side. In cases where the lung cannot expand we must do the operation of Estländer or that of Schede, although these formidable operations are rarely necessary in children. Wightman's figures in the following paper show that the mortality from simple incision is about equal to that of rib-resection. Rib-resection is of course rarely required in an acute case.]

Wightman[1] considers the **mortality from empyema in childhood.** He maintains that an early diagnosis means a favorable prognosis. The rapidity of convalescence averages from 6 to 8 weeks. If the condition is left alone, it must always prove fatal. Signs of a recent attack of scarlet fever are by no means uncommon in patients who seek relief from empyema at the Children's Hospital. The article on scarlet fever recording 1008 cases, occurring principally in children, which appeared in the Lancet for 1891, has no mention of empyema as a complication. This leads us to infer that empyema is most likely to occur if a case of scarlet fever is neglected. The younger the patient with empyema, the greater the danger of a fatal result. The sooner pus is removed, the quicker the recovery. Rupture through the wall of the chest or rupture through the lung is a very grave complication, though the latter accident occasionally leads to spontaneous cure.

Apart from the danger of rupture, life is chiefly threatened by complications: 1. Pericarditis; 2. Peritonitis; 3. Septicemia. Wightman does not think resection of the rib renders the chance of cure greater or less except in certain cases. At the Hospital for Sick Children, Great Ormond street, from 1880 to 1892, 214 cases were treated; 85 were treated during the earlier period by incision, with 16 deaths, and 129 by rib-resection, with 23 deaths, the mortality being nearly the same in each case. Mr. Godlee in 1886 published the

[1] Lancet, Nov. 30, 1895.

result of 36 cases; 19 were treated by resection, the remainder by incision or aspiration. Only 1 of these cases was fatal. Wightman published, in the Lancet, May 5, 1894, the results of 118 cases, classifying all treatments together. These cases showed 23 deaths. Batten exhibits the results in the Hospital for Sick Children in Great Ormond street for the year 1893–94, showing 43 cases treated by resection, with 5 deaths, and he asserts strongly that resection is the only treatment for empyema; but Wightman maintains that this statement must be accepted with reserve. Cantley in his paper before the London Medical Society in a series of 86 cases treated by various methods showed a mortality of 16.6%, the mortality being the same after resection as after incision, with the exception that 5 out of 6 cases under 2 years old treated by resection were fatal. Cantley's opinion is that resection ought only to be employed in cases in which the tube cannot be inserted without it, when drainage is imperfect, or when we are operating for the cure of an old sinus. Morison had 2 deaths in 34 cases, and maintains that incision is the proper operation. By the courtesy of Mr. Lloyd of Birmingham, Wightman gives the results at the Birmingham Midland Hospital for the last 25 years. There were 123 cases; 99 were cured, 20 died, and 4 were not recorded. There were 43 cases in children of 3 years of age or under, and 18 of these were fatal. In 99 cured cases the average hospital stay was 7½ weeks, the shortest stay being 11 days and the longest 164 days. Resection was performed in only 6 cases. In this hospital the routine treatment is incision and drainage as soon as pus is diagnosed, and resection of the rib is rarely done as a primary procedure. If the above figures are combined, they give 656 cases of empyema in children, with 104 deaths, a death-rate of 16%. The extreme gravity of empyema in young children may be seen by the following table, which considers children 3 years old:

Mortality from Empyema in Children 3 years old and under.

	Cases.	Deaths.
Dr. Goodhart (Guy's Hospital Reports)	29	19
Birmingham Children's Hospital	43	18
Liverpool Children's Hospital	36	18

These figures give a death-rate of a little over 50%.

Marshall[1] was induced by Wightman's paper, which we have previously noted, to collect the cases of empyema which had been under his own care since May, 1879. All his cases were treated by free incision with the exception of 2, where, owing to the grave condition of the child and the extent of effusion, it was deemed best to relieve the chest by a limited aspiration some hours before free incision. Marshall thinks this precaution is very useful. Marshall had 45 cases with 7 deaths. Only 7 of these cases were under 3 years of age, and of these 2 died. The method of treatment may be summarized as follows: 1. Free incision; 2. A single tube in infants, but a double-barrel tube in all above the 3d year; 3. The complete emptying of the chest

[1] Lancet, Dec. 21, 1895.

of fluid for the first week after operation by turning the child on the side, as one would empty a barrel, twice every day. This emptying is assisted by efforts at coughing if the child is old enough to understand; 4. The removal of the tube at the end of the first week; 5. Allowing the patient to sit up and move about as soon after the first week as possible, thus helping the expansion of the lungs.

The writer has never found it necessary to resect a portion of the rib in an acute case. The following facts were of interest in connection with the deaths: with 1 exception every fatal case was on the left side. This fact confirms the belief that left-sided pleuropneumonia is more dangerous than the right-sided variety. In every death there was a history of long illness before admission—illness for from 6 weeks to 3 months. In 1 case gangrene of the lung was supposed to exist, but postmortem did not disclose it. Of the 2 deaths occurring in children under 2 years of age, 1 was due to chicken-pox, and in both the children were very rhachitic. One case suffered from thrombosis of the left iliac vein 6 days after operation, and died on the 8th day. Marshall concludes that free incision when performed early is a very successful operation: that rib-resection is never required in an acute case; that death at any age is rather the result of neglect to recognize the true nature of the case than it is of the operation itself. [Blowing systematically in a washbottle is a great aid to lung-expansion if a child has reached an age when he can be made to carry it out.]

Fulton[1] advises the use of **the curet in operations for empyema,** because he has found that a certain number of cases in which resection of rib followed by drainage has been done do not go on to complete recovery, but require other operative measures or else terminate fatally. The question is how to reduce the already small percentage of failures from operation, and the writer thinks the cause of failure is often due to incompleteness in operation. We may find any one of two or three different conditions present. We may find only pus in the pleural cavity; we may find also large masses of coagulable lymph. We may find also that the pleural surfaces are covered with a deposit of lymph even to the thickness of several lines. In the first of these conditions drainage will bring about cure; in the second the coagula must be removed with a scoop or a finger if drainage is to effect a cure; in the third the lymph upon the pleural surfaces must be removed by means of a curet. After resection, douche the cavity with hot water; the entire cavity is then gone over with a curet, the douche being kept going all the time. The pleura must not be wounded, and in order to reach the entire surface curets must be used which have flexible handles. After the entire cavity has been curetted and irrigated it is dried and packed, and the treatment from that time is the same as if we were dealing with a large abscess anywhere. [The fallacy in this plan is that the treatment is based upon the assumption that we wish to obtain granulations as in an ordinary abscess. We do not wish to obtain anything of the sort. Filling of the cavity is not brought about by granulation,

[1] Med. Rec., Nov. 2, 1895.

and is brought about by expansion of the lung, elevation of the diaphragm, and contraction of the chest-wall. Irrigation of the pleural sac has been proved by ample experience to be dangerous. Curetting the pleura is, in the first place, useless, and is, in the second place, more dangerous than irrigation.]

Gamgee [1] discusses the details of 25 **tracheotomies** in children under 2 years of age; 21 of this number were operated upon for membranous croup or diphtheria, and 11 were cured. Of 8 patients of 2 years of age or under, there was 1 recovery. This was in a patient who had a scald of the larynx. There were 16 operations on children of more than 2 years of age, with only 3 deaths. Gamgee quotes from the statistics of Fischer of Hanover, covering the period of January, 1894, to September, 1895, in which there were admitted into the Hanover Hospital 1510 cases of diphtheria, and tracheotomy was done upon 1000 of these. In 1885 there was no epidemic of diphtheria, and in this year there were 48% of recoveries. In 1886 and 1887 there was a bad epidemic of scarlet fever, and there were only 27% of recoveries. These figures show that the results of tracheotomy and diphtheria depend largely upon the type of the disease, and that the mortality is always higher when an epidemic of scarlet fever or of diphtheria exists. Two other facts influence the mortality of the operation: first, the presence or absence of pneumonia, and second, the severity or mildness of the asphyxia. The indications for operation are retraction of the cartilages, a progressive increase of the symptoms despite medical treatment. Chloroform should be given except when the child is semi-conscious and cyanosed. The general rule of operation is that the isthmus of the thyroid gland is drawn downward, the deep cervical fascia is cut transversely, and the trachea is incised above the isthmus. If we are dealing with a child who has a short neck, we need never hesitate to cut the isthmus. The bleeding is slight, the method gives a good exposure and saves much time. Unless the case is urgent, the trachea ought not to be opened until bleeding has ceased. The tube employed should be a bivalve, should have a movable shield, and should be as large a size as possible. The operator must be very careful not to strip up the fascia in front of the trachea, as emphysema of the mediastinum may result over the entrance of air beneath this fascia. After operation the patient should be placed in a tent near the fire, but we should use no steam kettle, as the moist atmosphere weakens the patient and does not benefit him. Considerable amounts of food should be given by the mouth unless fluids are regurgitated through the trachea-tube, and in these cases we must feed by a nasal tube. At the end of a week we can begin to make attempts to leave out the tube. This is done gradually, so that the child regains the capacity to breathe through the larynx; in some few cases the tube must be worn for a longer period of time, even for life. One of the most difficult things to overcome when the child again attempts natural breathing is fright. This fright produces spasm of the larynx. We can overcome this by using a tube with an opening on its convex surface, which opening can be plugged for a few minutes at a time now and then. In some cases granulations form at the

[1] Birmingh. Med. Rev., Mar., 1895.

tracheolaryngeal junction. A well-fitting tube which is dispensed with soon prevents this complication. If granulations do form, they must be touched with nitrate of silver. [In urgent cases we can open the trachea even before hemorrhage has ceased. This can be done with entire safety if the patient is recumbent with the head lowered. The hemorrhage is largely venous, and the venous channels are distended because of asphyxia. The opening of the windpipe relieves asphyxia, and hence the venous distention, and the relief of venous distention leads to the arrest of hemorrhage.]

Warren[1] presents an interesting case of **cervical rib** which was removed by operation. The patient was a woman 35 years of age who for years had had pain about the shoulder, which she supposed was rheumatic. During the last 2 or 3 years the pain became much aggravated; it was felt chiefly about the middle of the right clavicle and extended down the arm, sometimes all the way to the lower end of the ulna. Of late the power of the arm seemed to have diminished. A bony tumor was found behind the middle of the right clavicle, which tumor appeared to arise from the first rib. A large artery was found overlying the tumor. The outer border of the tumor was found to be very sensitive. A much smaller bony prominence, but one entirely similar, was found on the opposite side of the neck. Warren uncovered the whole region of the tumor by making a large rectangular flap. He incised the fascia and exposed a bony mass which lay upon the inside of the subclavian artery and on the outside of the brachial plexus. This mass was found to be a rib articulating with the first rib by a facet situated a short distance behind the insertion of the scalenus anticus. The scalenus medius was inserted into the cervical rib. This rib was disarticulated and removed piecemeal, nearly up to its point of origin from the 7th cervical vertebra. Removal of the bones seemed to relax the brachial plexus, which had been somewhat stretched. The patient made an excellent recovery, has had no pain since, and has recovered the use of the arm. Warren reviews the literature of the subject, and quotes especially the paper of Ehrlich and the paper of Tilmanns. [Cervical ribs lead to great errors of diagnosis. In some cases the pulsation of the subclavian artery over a cervical rib has led to the view that an aneurysm existed. Some of these ribs are short; some of them are long, joining the first rib or first costal cartilage; some are immovable and some are movable. They rarely cause symptoms. T. de Quervain[2] has recently put another case upon record which he operated upon and removed.]

DISEASES OF THE VASCULAR SYSTEM.

Delorme and Mignon[3] have devised a method for **puncture and incision of the pericardium** which they think far safer than that formerly employed. The operation for puncturing the pericardial sac is as follows: A very small skin-cut is made in the 5th left interspace, close to the sternal margin, and an aspirating needle is introduced closely against the bone. The needle is

[1] Boston M. and S. Jour., Mar. 12, 1896. [2] Centralbl. f. Chir., No. 407, 1895.
[3] Gaz. des Hôp., No. 149, 1895.

kept first by the sternal edge, and then by the posterior surface of the sternum for a centimeter, and is then pushed directly downward and a little backward to a depth of several centimeters until liquid appears in the aspirator. To practise incision of the pericardium the surgeon finds the edge of the left pleura and pushes it outward. Two centimeters of the 5th and 6th cartilages are excised by means of gouge forceps, commencing at the edge of the sternum. The intercostal vessels of these spaces and the triangularis sterni are then pushed away with the fingers. The pericardium is distinctly visible at the bottom of the wound, being of a pearly-white color.

[In regard to the pericardium it is interesting to note that Dalton sutured a stab-wound in the pericardium, and the patient recovered. 5 in. of the 4th rib was resected, the intercostal artery was ligated, the pleura was cleansed of blood and clots. The incision in the pericardium was 2 in. long, and was closed with a continuous catgut suture.]

Ferguson[1] suggests a method of operation upon **varices of the leg** (Fig. 61). He thinks that Madelung's method, which consists of cutting down immediately over the varices and resecting them in part, has the difficulty of encountering the body of the veins at their pathological points, and the disadvantage of not getting at the branches. The operation is not sufficiently radical, and return is liable to recur in the diseased veins left unremoved. The method of Phelps, which consists in cutting down over the varices and applying multiple ligatures, makes too many punctures and does not get completely at all the venous branches. Schede made a circular incision around the leg, rolled one cuff up and another cuff down, with the idea of reaching the different venous branches and removing them. But we can only reach a limited amount of the varices with the circular incision. A circular incision below the knee cannot expose the veins above or behind it, and vice versa.

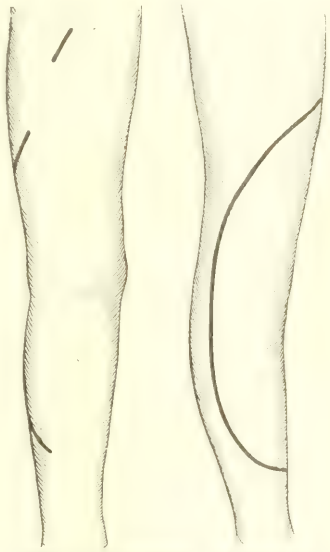


FIG. 61.—Ferguson's incisions for varicose veins (Chicago Med. Recorder, June, 1896).

Ferguson's method is as follows: The saphenous vein is tied in two places near the femoral, above its abnormal area, and a section of the vein is removed. The object of doing this part of the operation first is to allow all the varices to show. A semilunar incision is now made through healthy skin, and is extended as far down as it is necessary to go until we partly surround all of the varices. It is then deepened through the superficial fascia and fat down to the fascia lata. In the line of this incision we cut off all the venous supply. When the incision is completely down to the deep fascia, the entire flap is raised and dissected up. The veins normal

[1] Chicago Med. Recorder, June, 1896.

and pathologic are raised with the flap, and the varices and their branches are dissected away from its under surface. In raising the flaps the venous communications with the deep veins are severed and ligatured.

This method also exposes varices of the short saphenous. Ferguson has used this method for over 3 years. He sometimes uses 2 semilunar incisions instead of 1 when the varices are far apart and the intervening veins are normal. [Trendelenburg advised ligation of the long saphenous vein below the saphenous opening. All the above operations seek cure by lessening the amount of the column of blood. An apparatus has been advised to accomplish this, a sort of truss which has been highly praised as obviating the necessity for operation. (See *Year-Book* for 1896.)]

Patrick J. Hayes[1] suggests a modification of the **distal ligature for aneurysmal dilatation.** Every now and then the surgeon is confronted with cases where it is impossible to deal with the proximal portion of the diseased artery, and where he must consider the problem of inducing coagulation within the sac either by distal ligation or the extremely hazardous method of introducing foreign agents through the sac-wall. After these operations of ligation there is occasionally observed a prolonged delay before there is any evidence of improvement, and in the thin-walled aneurysm such retardation may entail rupture of the wall, when otherwise cure would have been the result of operation. Hayes advises a method which he thinks will rapidly secure the formation of a thrombus extending from the distal point quickly and safely.

The surgeon exposes the arterial trunk, and passes two ligatures beneath it with a $\frac{1}{2}$ in. of distance between them. The distal ligature is at once tied. The proximal ligature is loosely tied with a single knot which just serves to very moderately compress the arterial walls. A small incision is made in the artery midway between the ligatures, and through this incision a slender cannula carrying a piece of catgut is introduced and directed toward the proximal portion of the vessel. The gut is pushed on through the cannula until its end has reached or entered the aneurysm. The cannula is then withdrawn and the proximal ligature is firmly tied. The artery and the free part of the catgut are now cut across at the site of aperture between the ligatures. This foreign substance introduced into the sac soon becomes enveloped in a coat of fibrin, and, as it were, acts as a gubernaculum for the extension of the coagulating process. At the same time we have not injured the sac-wall by any needle-puncture, while the risk of distant embolism has been guarded against by the previous distal ligation.

W. S. Kerr[2] of the Sheffield Infirmary reports an interesting case in which a large-sized **iliofemoral aneurysm was cured by compression** of the abdominal aorta. The patient was anesthetized, and Lister's abdominal tourniquet was applied a little below and to the left of the umbilicus. It was found that by moving the tourniquet a little lower and a little more to the left the pressure was determined toward the left common iliac artery, which

[1] Lancet, Oct. 12, 1895.

[2] Quart. Med. Jour., Oct., 1895.

allowed the circulation in the right limb to become reestablished and relieved the cyanosis there. The anesthetic was continued for 7 hours. After the pressure had been on $5\frac{1}{4}$ hours the tumor appeared to be quite solid, and the tourniquet was slowly relaxed at the rate of a quarter turn a minute. After a few turns of the screw the cyanosis in the left limb began to disappear, and 7 hours after the beginning of the procedure the tourniquet, being quite loose, was removed. The aneurysm was found solid without a trace of pulsation or bruit, and no pulse could be detected in the left femoral, popliteal, or posterior tibial arteries.

The progress of the case was one of gradual recovery as far as the tumor and the general health of the patient were concerned, although on the 4th day the toes of the left foot became gangrenous and soon separated.

Hufschmid[1] reports a successful **ligation of an aneurysm of the vertebral artery.** Compression of the common carotid artery was found to control the pulsation in the large bloodvessels which overlay the tumors, but not of the tumor itself. An incision almost 3 in. long was made over the level of the thyroid cartilage along the posterior margin of the sternocleidomastoid muscle and then deviating to a distance of a finger's breadth from this muscle. The incision reached the supraclavicular fossa. The clavicular portion of the sternomastoid was divided a little more than an inch above the clavicle. The muscle was sewed with catgut, the wound was closed with silk and silver and was drained with iodoform-gauze. There was complete cure.

Herbert L. Burrell[2] reports a case of **ligature of the innominate artery** in which the patient lived 104 days, and died finally, not from the result of operation, but because of the general congestion of Bright's disease. Burrell appends a table with all of the reported cases.

Brigade-surgeon-lieutenant-colonel W. F. Stevenson and Surgeon-major H. J. Michael[3] report a case of **transperitoneal ligature of the common iliac artery** for diffuse traumatic aneurysm of the external iliac and common femoral arteries. The operation was divided into two stages. They first ligated the common iliac by the transperitoneal method, and at a later period made an incision over the tumor in the line of the sartorius muscle, turned out $2\frac{1}{2}$ lb. of soft blood-clot, and packed the cavity with iodoform-gauze. There was little or no hemorrhage.

Souchon[4] of New Orleans reports the case of a man with **two aneurysms** of the left thigh, one in Scarpa's triangle as large as an egg, and the other at the adductor opening as large as a cocoanut. The superficial femoral was ligated after compression had failed to cure. The surgeon ligated the artery in the middle of Scarpa's triangle, and used a double continuous kangaroo ligature, so as not to rupture the coats of the vessel. This required tying the bleeding upper end of the vessel with silk. Pulsation ceased in the aneurysm by the adductor opening, but returned in the upper aneurysm. Hemorrhage occurred again, and both ends had to be tied. The patient was

[1] Arch. f. klin. Chir., 1896, B. lii. H. 1, p. 23.
[2] Boston M. and S. Jour., Aug. 8, 1895.
[3] Lancet, Jan. 25, 1896.
[4] N. Y. Med. Jour., Nov. 2, 1895.

ill for a long time, and during this time the lower sac was opened and the clots were turned out, and the upper wound was opened and a silk ligature remained. The patient finally recovered.

The author thinks that previous application of compression complicated the case. In high femoral aneurysms he thinks it would be well to apply a provisional ligature to the artery. He thinks it would have been better to have extirpated the upper aneurysm rather than to have ligated, and this would have cured both aneurysms at once.

W. Thelwall Thomas[1] of Liverpool reports a case of **cut-throat** in which all the carotid arteries and all the jugular veins on one side were ligatured, and in which the patient was given intravenous saline transfusion and finally recovered. The sternomastoid and omohyoid muscles were cut; the internal jugular vein was cut through; its cut ends were collapsed and three-fourths of an inch apart. The common carotid artery was cut into, but not divided. The thyroid cartilage was notched, and the external and anterior jugular veins were severed. The following treatment was pursued: Ligature of the common carotid in two places (3 and 4, Fig. 62); ligature of the internal jugular in two places (1 and 2, Fig. 62); ligature of external and anterior jugular; perfusion of 20 oz. of saline fluid. Twenty-two days later secondary hemorrhage occurred, and an attempt was made to ligature the common carotid (5, Fig. 62). Ligature of internal jugular and branch (6 and 7, Fig. 62) was performed by Mr. Bickersteth. In 9 days more there was another hemorrhage from the internal carotid, which was treated by packing and pressure and the injection of 2 pints of warm water by the rectum. The patient subsequently recovered.

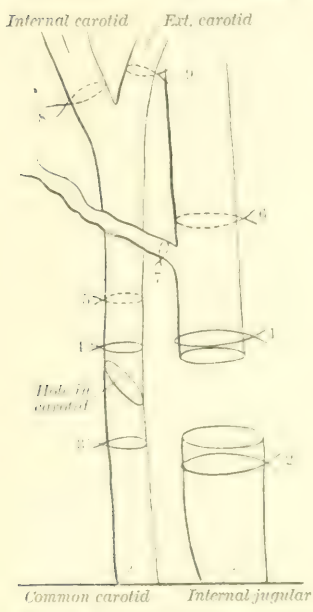


FIG. 62.—Ligatures applied in Thelwall Thomas's case of cut-throat (Brit. Med. Jour., Dec. 7, 1895).

Ricard[2] reported to the Ninth French Surgical Congress 2 cases in which he had successfully **sutured large veins.** In the first case he sutured the brachiocephalic vein with a Lembert suture, and supported the vein by suturing the tissues carefully about it as well. In the other case he sewed up an incision in the femoral vein with four stitches, just as in the ordinary wound, and then stitched the soft parts above it. Both cases got perfectly well without hemorrhage or subsequent circulatory disturbance, so that the inference is just that the lumen of the vessel was left free.

Glück[3] of Berlin says that in many cases **wounds of veins** have been successfully sutured. He says that Zoege-Manteuffel in extirpating an arterio-

[1] Brit. Med. Jour., Dec. 7, 1895.
[2] La Presse méd., Nov. 6, 1895.
[3] Berl. klin. Woch., Aug. 26, 1895.

venous aneurysm of Scarpa's triangle ligated the deep femoral artery, closed a wound in the femoral vein by lateral sutures, and then, having wounded the common femoral artery, sutured that vessel also, the patient recovering without gangrene. He says that Israel successfully sutured the common iliac.

Heidenhain[1] reports a successful case of **arterial suture.** He was operating on a carcinoma of the breast, and an assistant wounded the axillary artery while using the scissors. The wound was longitudinal. The edges of the wound were picked up with forceps, and the wound was sutured with a fine catgut suture inserted with a round intestinal needle. The suture scarcely narrowed the vessel's caliber. It was found necessary in this case, because of the extensive nature of the disease, to remove a portion of the axillary vein. The pulsations of the artery continued, and 6 months afterward the patient was in excellent condition.

Heidenhain does not approve of inverting the walls and sewing only the adventitia and media, but he believes in bringing the endothelial surfaces in contact by approximating the surfaces of the intima. [Ricard successfully sutured a tear in the innominate vein.]

W. A. F. Bateman[2] of the Richmond Royal Hospital reports a case in which operation was performed for **cancer of the head of the pancreas,** and in which transfusion was rendered necessary by the exhausted condition of the patient during operation. He used for transfusion defibrinated sheep's blood from a recently selected animal. The blood was mixed with an equal quantity of water in which was dissolved table salt in the proportion of a dram to a pint, and the mixture was carefully strained through fine muslin. The temperature of the fluid when injected was 98° F. He used to inject with a common Higginson's enema apparatus to which was attached an aspirator needle. He injected not quite 8 oz. He considers that the injection greatly improved the condition of the patient. He thinks that the method is worthy of a further trial—first, to determine whether the material is as valuable as human blood; second, because there are obvious advantages in its use. It is easy to obtain, and we are free from the danger of injuring a person by abstracting blood.

Gottschalk[3] advocates the use of stypticin as a hemostatic. Stypticin is an agent which is obtained by oxidation of narcotin. It may be given hypodermically or may be administered by the mouth. Three-fourths of a grain administered five or six times a day will produce no evil effect. One great advantage is that it is not only hemostatic, but it is strongly sedative both locally and generally.

C. Hamilton Whiteford[4] has been much struck by the **profuse hemorrhage** which occurs during **Estlander's operation.** In order to lessen this hemorrhage he advises the following method: After exposure of the thoracic wall the intercostal arteries are compressed by ligatures on each side of the pieces of rib to be removed. An aneurysm needle is passed unthreaded from the middle of one intercostal space, entering the pleural cavity, to the

[1] Centralbl. f. Chir., 1895, p. 1113.
[2] Brit. Med. Jour., Jan. 4, 1896.
[3] Ibid., 1896, No. 1828, p. 7.
[4] Lancet, Mar. 7, 1896.

space above, and brought out close to the upper border of the rib above. The needle is then threaded and withdrawn, and this ligature when tied contains below the rib a bundle of intercostal muscle which plugs the intercostal groove. The entire thickness of the chest-wall is removed between two rows of these ligatures and close up to them, the bleeding being confined to the divided ribs. Where time is no object the periosteal flaps to cover in the cut ends of the rib tend to prevent subsequent necrosis, probably by preventing the infection of the bone by pus from within. The ligature should consist of some absorbable material. [If we resect rib after rib, removing each as if we were doing a separate operation, we can easily push the periosteum off of the rib and carry with the periosteum the intercostal artery. The artery is tied before the lower layer of periosteum is incised and before the pleura is cut. We find that this method greatly limits hemorrhage.]

John McMullen[1] considers the value of the **Esmarch bandage in hemorrhage and shock.** One does not always have a transfusion apparatus convenient. It is true that axillary injection is very valuable, but absorption from the subcutaneous tissues is slow in shock. For this reason he mentions a treatment not in general use. He takes an Esmarch bandage, wraps all the the limbs firmly, beginning at the distal end, thus driving all the blood into the body, stimulating the heart and giving it less to do. If he does not have an Esmarch bandage, he uses an ordinary bandage and applies a tourniquet over the main artery. This is of great value in burn cases in children and in postpartum hemorrhage, and in some cases of heart-failure. It is especially useful in case of threatened death from chloroform. [This is the old method of autotransfusion, devised, we believe, by Hunter, although McMullen employs a rubber bandage instead of a muslin one. The method is often employed in the Philadelphia hospitals.]

McNeill[2] of Australia maintains that voluminous **intestinal enemata of hot saline solution** are of great value in cases of hemorrhage. The tube must be carried through the sigmoid flexure, and the injection must be forced until it causes decided tension, because the greater the tension the greater the absorption.

Whitelaw[3] of Edinburgh places on record some interesting observations in regard to **hemorrhage,** and he considers that hemorrhages are predisposed to by an abnormally high barometric pressure.

A. E. Hind[4] reports a case of **hemorrhage from the extraction of a tooth** in which pressure and plugging had failed to arrest the hemorrhage. It was instantly arrested by freezing with ethylchlorid spray after clearing out the clots. To prevent recurrence on thawing, wool soaked in tincture of hamamelis was applied. [In a recent case seen by one of the editors (DaCosta) with Dr. Wylie of Philadelphia the cavity was frozen with ethylchlorid, and was packed with gauze wet with a 10% solution of antipyrin. A roll of gauze was placed over the plug of gauze, and this roll forced the jaws apart. A

[1] Brit. Med. Jour., Mar. 14, 1896.
[2] Australian M. Gaz., Dec. 20, 1895.
[3] Brit. Med. Jour., May 30, 1896.
[4] Lancet, Jan. 25, 1896.

Barton's bandage was firmly applied so as to make continued pressure. Bleeding was at once arrested and did not recur. The plugs were removed in 48 hours, a light packing was inserted in the tooth-cavity, and the bandage was not reapplied.]

"The Treatment of Excessive Hemorrhage" is the title of an article by Charles Jennings.[1] He considers the relative merits of various plans of treatment. There is no question that the injection of saline fluid into the

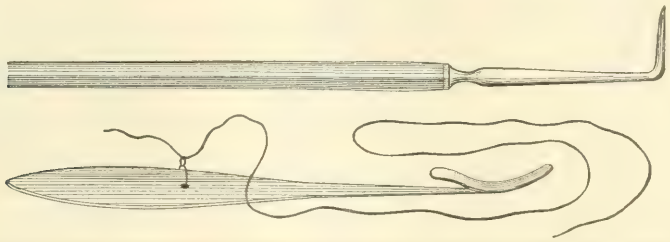


FIG. 63.—Jennings' instruments for exposing and tying the vein (Brit. Med. Jour., Feb. 8, 1896).

subcutaneous cellular tissue is one of the methods by which the effect of otherwise fatal hemorrhages may be counteracted, but absorption of fluid from the cellular space is tardy. It may take 2 hours before there are indications of

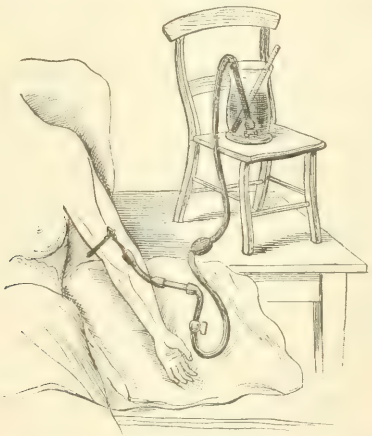


FIG. 64.—Transfusion of saline fluid (Jennings, in Brit. Med. Jour., Feb. 8, 1896).

improvement, whereas when we inject into a vein benefit is instantaneous. Jennings presents the instruments for intravenous injection and for transfusion which he invented, and which enable us to rapidly perform the operation. The accompanying illustrations (Figs. 63–65) render clear this method.

[If saline fluid is thrown into the connective tissue, absorption is greatly accelerated by employing toward the heart after the plan of Münchmeyer. The custom of leaving several pints of saline solution in the abdomen after a laparotomy has been approved by many surgeons. (See Treatment of Hemorrhage by Infusion of Normal Saline Solution, John H. Glenn, in Dublin

[1] Brit. Med. Jour., Feb. 8, 1896.

Jour. of Med. Sci., Sept., 1895.) Ponfick has employed direct injection into the abdominal cavity. The rectum will often absorb when the stomach will not; hence rectal injection of normal salt-solution is a valuable expedient. It is a routine custom in the Johns Hopkins Hospital to give such an injection

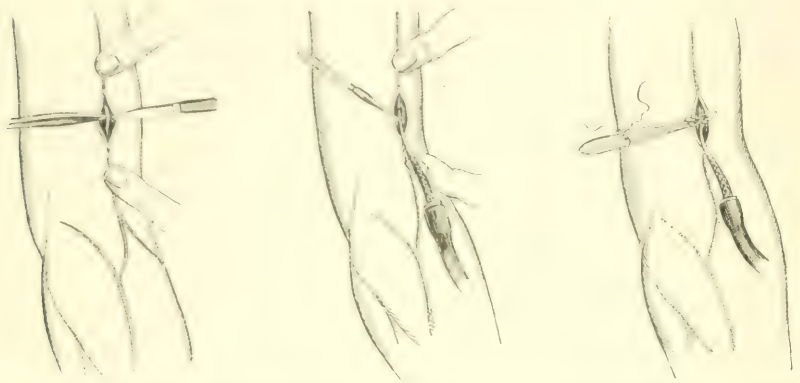


FIG. 65.—Exposure of vein and insertion of cannula (Jennings, in Brit. Med. Jour., Feb. 8, 1896).

before the patient is taken from the operating table. It prevents thirst and hemorrhage, and reacts the patient from shock. The best method in severe cases is by intravenous injection. Glenn thinks that intraarterial injection has a promising future (see Collin's apparatus, p. 224).]

Mr. Thomas Bryant, the distinguished surgeon of Guy's Hospital, has a valuable article in the Lancet, May 9, 1896, upon **obstructed arteries,** and he reports many interesting cases: one case of aneurysm of the aorta, giving rise to laryngeal symptoms, apnœa, and sudden death, in which there was almost complete closure of the orifice of the left subclavian artery; another case, of aneurysm of the aorta and innominate artery, in which ligature of the right common carotid was undertaken; death occurred on the 14th day. There was obliteration of the origin of the left subclavian. He then considers laceration of the inner coat of the aorta with fracture of the spine and laceration of the jejunum; a case of contusion of the arm with occlusion of the brachial artery; a case of lacerated and obstructed axillary artery in a boy aged 8 years; a case of separation of the lower epiphysis of the humerus from the diaphysis and displacement of the epiphysis of the bones of the forearm backward, with occlusion of the brachial artery; a case of compound fracture of the humerus, with occlusion of the brachial artery; a case of compound fracture of the humerus into the elbow-joint, with occlusion of the brachial artery; a case of contusion and occlusion of the external iliac and common femoral arteries; a case of ruptured popliteal artery, occluded artery; fractured pelvis with obstruction of the external or common iliac artery; fracture of the pelvis, occlusion of the external iliac artery, gangrene of the foot and leg; fractured pelvis through the thyroid foramen, occlusion of the iliac artery, rupture of the urethra, and partial rupture of the bladder. The ultimate consequences depend on treatment. A limb suddenly deprived of its arterial blood-supply is more

apt to become gangrenous than when the deprivation has been gradual. This tendency to gangrene is due primarily to the sudden deprivation of the tissues of nutriment, and secondarily to the blood-stasis which follows the accident, either because of simultaneous injury of the accompanying veins or from the loss of normal vis a tergo. The object of the surgeon is to encourage in all ways the arterial as well as the venous circulation, and to guard against blood-stasis. We should place the limb, if it be the lower extremity, upon a splint to keep it quiet, after it has been carefully rubbed upward and gently kneaded to encourage the flow of venous blood through the muscles and deeper parts. This splint, with the limb upon it, is raised sufficiently, but not more than sufficiently, to help the return of venous blood to the heart, but not enough to interfere with the supply of arterial blood through the new arterial channels which have to undergo compensatory enlargement. Hence the foot should not be more than 1 or 2 in. higher than the knee, nor should the knee be more than 1 or 2 in. higher than the hip. The limb is cold and requires warmth, but to apply too much warmth or to apply it too suddenly will do harm, for an excess of warm blood would then be thrown into the part, and, as the power of the tissues to pass blood on is largely lost, stasis will inevitably result. Warmth should be applied cautiously, and not until the venous circulation has been helped by gentle upward rubbing and by kneading of the deeper tissues with a warm hand below the seat of injury. Subsequently the limb should be wrapped in cotton wool and gentle pressure should be applied by means of a flannel bandage. In the general treatment of the case we should avoid overstimulation, and simple nutritious food should be given. Wine and spirits must be administered with great caution. Should gangrene follow, amputation will be necessary, but it should not be performed until indication is afforded of the extent to which it is likely to spread—until, in fact, a line of demarcation can be made out—and then amputation should be performed above this line in healthy tissues. We need not perform the amputation far from the line, as we do in senile gangrene, for in senile gangrene the vessels of the limb are known to be diseased, whereas in the injuries we are discussing they are probably sound, except at the seat of injury. If septic changes take place in the limb, surgical interference must be hastened, but if the limb has been rightly treated and well raised, the probabilities are that only dry gangrene will occur; whereas if the limb has become swollen and edematous, septic changes are sure to show themselves. In dry gangrene delay is to be sanctioned. In the moist form surgical interference will be called for at an early period, and must be carried out under unfavorable circumstances. In treating fractures complicated with obstructed arteries, in most cases the surgeon should assume the attitude of expectancy, for in most cases of this kind the limb is sufficiently well nourished to undergo repair. It is only in exceptional cases that gangrene follows and amputation is demanded.

Bryant concludes his paper by quoting 7 cases, in each of which at some antecedent period a large artery had been obstructed, and recovery followed. The cases came before him for some independent surgical operation.

DISEASES OF THE LYMPHATIC SYSTEM.

J. Schwinn[1] of Wheeling, W. Va., reports a case of **injury to the thoracic duct** during an operation at the root of the neck. He was operating for a mass of tubercular glands on the left side of the neck, and during the entire operation there was no indication of anything going wrong, and the wound healed its whole length by first intention, but on the 10th day after operation a swelling appeared over the left sternoclavicular region. There was no fever and no pain. Two days later the swelling was notably larger and fluctuated. The lower angle of the incision was opened with a probe, and there gushed forth a liquid looking like skimmed milk, and proving under the microscope to be chyle. About 1½ oz. were obtained. Exploration disclosed a cavity containing 2 oz. more, and this cavity was packed with iodoform-gauze. The packing made matters worse, and the quantity of chyle discharged during the 24 hours after the packing amounted to nearly 2 pt. This heavy loss of nutrient material affected the health of the patient. He lost flesh, grew weak, and had severe attacks of syncope. He suffered with most intense thirst, and whenever fluids were given him to relieve this thirst there was an increased flow of the chyle. The patient was taken back to the hospital, the original incision was opened, and the leaking point was found in the form of a small vessel torn through, the free opening being the size of a knitting needle. This vessel was so situated that ligation would have been difficult; Schwinn therefore put a clamp on and packed the cavity around this with gauze. The clamp came off on the 3d day and the patient made a complete recovery.

This case differs from all other reported cases of injury of the thoracic duct in the fact that the flow of chyle did not begin during or soon after the operation, and, further, in the fact that the gauze tampon made the flow worse. This occurrence may be explained in the following way: There was a tear of one of the large branches of the thoracic duct. During and shortly after the operation, the walls of this torn vessel being curled in, the escape of chyle was prevented. But when the vis a tergo from the main duct came into play the obstacle was removed and there was a slight flow, corresponding to the size of the vessel, pressure resting on it from the overlying skin and dressing. As soon as the gauze tampon was introduced right to the open mouth of the torn vessel the chyle was drained away from the main duct in much larger quantities, so as to leave the impression that the main duct itself had been wounded.

The author advises that when we enucleate glands through the base of the neck we should always put a ligature around their lymph-vessels. [The ligature of the lymph-vessel is usually impossible, but it cannot be seen.]

Mr. D'Arcy Power[2] presents remarks on **cystic lymphangioma** in childhood, and makes report of a case. These growths may occur in any part of the body. They are not unusual in the neighborhood of the axilla. They are less frequently met with on the face, but they are seen in the tongue, where they cause macroglossia, and even in the mucous membranes of the intestines. A cystic lymphangioma varies from a few scattered cutaneous vesicles filled

[1] Ann. of Surg., May, 1896.

[2] Brit. Med. Jour., May 16, 1896.

with lymph to a tumor of great size. The scattered vesicles, to which the fanciful name of lupus lymphaticus and the more correct name of lymphangioma cutis circumscriptum has been given, will not be mistaken for anything else. But the more solid forms of tumors must be distinguished from enlarged lymph-glands, from fat tumors, from nevus or other form of blood-cyst, from the dermoid cyst, and from the sarcoma, for any one of these swellings may be found in the new-born child. They all increase in size shortly after birth. Local hypertrophy of the part, which is known as macrodactylia, either general or due to an overgrowth of a single tissue, is likely to be mistaken for a cystic lymphangioma occurring in one of the extremities. Diffuse lipoma is such a condition. But diffuse lipomata are much more liable to be mistaken for cystic lymphangiomata than are the well-defined lobulated swellings. Cystic lymphangioma can be distinguished from diffuse lipoma by the greater tenseness of the lymphatic swelling and by the peculiar elasticity which is recognizable when a number of cysts lie below the skin. The lipomata are softer and more doughy. The skin is more intimately attached to the lymphatic tumor than to the lipoma, unless it happens that the cyst lies beneath the deep fascia, when the skin will be found freely movable. Lymphangiomata usually present prolongations of their tissue which may run a considerable distance either deeply or superficially, or these prolongations may be present as isolated tumors which are separated from the main growth by an area of healthy tissue. Cystic lymphangiomata have also to be distingnished from cavernous nevi and those rare blood-tumors which arise subcutaneously or arise even beneath the muscles as pockets or pouches in the veins. Cavernous nevi only differ from cystic lymphangioma in being developed from the vascular instead of from the lymphatic system, but nevi are more common than lymphangiomata. They can always be reduced in size or even emptied by continued pressure, whilst muscular exertion and all efforts leading to venous engorgement increase their size. Some nevi have a varicocele-like feel, and the skin over some is the seat of capillary nevus. Nevi containing much connective tissue or fat or sarcomatous tissue are hard to diagnosticate from cystic lymphangiomata, and in such cases exploratory puncture may be necessary to give a correct diagnosis.

The author then reports an interesting case of a large lymphangioma involving the whole left side of the face and the upper half of the neck, in which operation was performed with the most successful result.

[The treatment of these cases is open to the widest divergence of opinion. Some cysts, even very large cysts, may disappear spontaneously, but this is a very unusual occurrence. The proper operation is the excision of the tumor. Electrolysis may cure the simpler cases, but at best it produces a fibrous tumor, and, as this will have to be removed, it will leave a scar as pronounced as if excision had been practised upon the original growth. Setons should never be used; puncture and drainage are rarely effectual, excepting in single cysts, such as hydroceles of the neck. In these single cysts puncture and drainage may be tried.]

DISEASES OF THE LIPS, PALATE, AND SALIVARY GLANDS.

The London Practitioner of August, 1895, contains a lecture by Christopher Heath upon the subject of **hare-lip.** He reviews the subject most practically and clearly. He thinks the best period to operate, unless there is some special indication or contraindication, is about the 6th week of life. The operation which he has for a long time employed with success is to freely pare one side of the lip, to cut a flap from the other side, and approximate it. The flap is taken from the longer side of the lip. He sews up with chromicized catgut, and unites two or three stitches through the mucous surfaces as well. The cheeks are drawn together with a strip of adhesive plaster. In order to prevent crying the child is given minute doses of opium and is frequently nursed. During the process of healing the child should be fed with a spoon. In double hare-lip, with projection of the intermaxillary bone, Heath insists that this bone must be cut away, for if it is left it will always be loose and will inevitably cause trouble.

Edmund Owen[1] considers the **operative treatment of cleft palate,** and reports 5 interesting cases to illustrate different aspects of this disorder. In regard to the time at which it is best to endeavor to close a cleft in the lip and in the soft palate, Mr. Owen says that he is choosing an earlier date for his operations. One of the patients in this list was just 2 years old when operated upon for complete cleft. If the speech is to be improved to the utmost, the mouth must be roofed at the earliest moment. A cleft in the soft palate can be closed in the first 6 months. With a hard and soft palate together it can be done in the second year, but he would not be surprised to hear that it may be safely done earlier. He no longer practises the division of operation into two stages, one for the hard palate and the other for the soft. He used to practise this method, but has given it up entirely. It is full of disadvantages, and it does not possess any merit to counterbalance them. Owen is much indebted to Clutton for his views upon the value of early operation.

Raymond Johnson[2] writes an article upon some unusual cases of **swelling of the parotid gland.** The swelling was on one side in each case, and there was no difficulty in excluding swelling due to enlarged lymphatic glands. These cases were obviously not mumps. There had been no exposure to the contagion of mumps. The swellings were far more prolonged, but one parotid gland was affected and there was absence of infection of other individuals. Salivary calculus was not present, neither were the cases to be considered as symptomatic parotitis or parotid bubo, such as may occur in the course of pyemia or typhoid fever. Neither could they be considered as belonging to the group made clear by Mr. Stephen Paget in which parotitis complicates various abdominal diseases and injuries, at times apparently independent of sepsis. His cases were swellings of the parotid gland resulting from interference with the escape of its secretion due to inflammation of the lining of

[1] Lancet, Jan. 4, 1896.

[2] Ibid., Apr. 18, 1896.

Stenson's duct. This conclusion was suggested by the fact that in Cases 1 and 2 pressure on the swollen gland caused the escape of a thick flood of mucus from the duct, and this was followed by a free flow of saliva from the duct.

DISEASES OF THE THYROID GLAND.

The British Medical Association in 1895 discussed **the surgical treatment of cysts, adenomata and carcinomata of the thyroid gland, and of accessory thyroids.**

Mr. Butlin[1] said to his knowledge he had never seen a tumor of an accessory thyroid. He cannot but believe that the frequency and importance of thyroid tumors have been exaggerated. He has never removed a malignant tumor of the thyroid, and has never seen one removed, and he has never seen one where there appeared the smallest likelihood of successful radical operation. The examination of all museum specimens shows this statement to be true.

Prof. Keen called attention to the fact that on the continent of Europe thyroid operations were done without the use of anesthetics, except in children under 15 and in very nervous patients. There was very slight pain in the operation. When the anesthetic was given there was less hemorrhage, since the respiration was less laborious and the patient did not cough. During the ligation, in order that it might be seen whether the recurrent laryngeal nerve was included in the ligature, the patient was induced to talk. Prof. Kocher makes a transverse incision, convex downward, so as to get at the thyroid better and leave a well-concealed scar. The use of Halsted's subcuticular suture will obviate unsightly scars. Dr. Keen's own personal trouble in these cases had been hemorrhage. In Switzerland great attention is paid to tying carefully every bleeding point, and not more than 2 ounces of blood are lost during an operation. Kocher cuts right down to the tumor, tying every source of bleeding. He commences extirpation at the upper part, which he can often wipe clean from the surrounding tissues. He next ties the superior thyroid artery and vein, and then goes right down to the thyroidea ima. He finally feels for and ligates both inferior thyroid arteries in succession, and then removes the tumor. [Sutton says positively that all cysts of the thyroid gland arise from adenomata. Enucleation is a comparatively recent treatment, and is the proper method for treating many goiters. Porta devised the operation of enucleating cysts. It is suited to single but not to multiple cysts. Socin is a strong advocate of enucleation, and was the first to apply it to noncystic tumors. Enucleation never causes myxedema, as it does not destroy any normal gland tissue, and in performing the operation the surgeon cannot injure the recurrent laryngeal nerve. The unbroken cyst can be dissected free, or the cyst-wall can be dissected out after the cyst has been incised and emptied. Roeber is an advocate of excision, and maintains that enucleation produces more hemorrhage than a properly performed excision.]

Shepherd[2] reports 16 cases of surgical treatment of certain forms of **bron-**

[1] Brit. Med. Jour., Oct. 12, 1895.

[2] Ann. of Surg., Sept., 1895.

chocele. He considers the forms suitable for operation are cysts and colloidal forms. He prefers the operation of enucleation, and he has done it 16 times without a death. In some cases with very thin cyst-walls enucleation will be impossible, and the cyst-wall will have to be picked out piecemeal, and this will cause profuse hemorrhage. The reasons which indicate operation are the existence of dysphagia, dyspnea, rapid growth, pain, discomfort, and great deformity. In cases where the growth only causes great nervousness it is justifiable to remove it. Shepherd unhesitatingly uses ether, and does not think that it unduly congests the vessels. After the cyst has been removed and the bleeding areas have been tied he packs with iodoform-gauze, and allows the end of the gauze to stick through the lower angle of the wound. He sews up the skin-wound with horsehair and patients leave the hospital about 8 days after the operation.

Mikulicz[1] reports 11 cases in which he operated for **exophthalmic goiter.** In 10 of these cases there was enlargement of the thyroid, and in 1 case a lymphangioma below the chin. The cases that he classes as true exophthalmic goiter were those in which in addition to true tachycardia he found distinct mental and nervous disturbances. Six of these cases he says were cured; 4 were markedly improved. Mikulicz thinks that any operation which decreases the size of the thyroid benefits the case, and may even lead to a cure, although complete cure will not be attained for several years. When the goiter is diffuse the afferent vessels may be ligated or a portion may be resected. In the first 48 hours after operation there is profound disturbance of the circulation and the respiration. [Herskin was operated upon himself and was cured. This surgeon collected 53 cases with 17 cures (over 40%); 3 died, and only 3 were not benefited. In 21 of the patients partial excision was practised; in 3 the arteries were ligated; in 1 iodin was injected; in 3 cauterization with zinc chlorid was employed. Kocher has reported 39 cases, most of which were completely cured, and all of which were greatly benefited, but he afterward had 3 deaths. Stephani divides cases into two groups: 1. Primary aberration of the nervous system, with a vascular enlargement of the thyroid. This should not be operated upon. 2. A genuine goiter exists from the start, and should be removed. Eisendrath has recently reviewed the subject of exophthalmic goiter. Kocher opposes the treatment by ligation of 4 vessels, because it is apt to cause the entire gland to atrophy, but he ligates 3 vessels. Wette holds that a goiter is the cause of Graves' disease, and not a mere consequence; hence, if cure is not soon obtained by medical means, an operation should be performed. He advocates the removal of from two-thirds to three-quarters of the gland. Removal of the entire gland would cause myxedema. Wette cautions us to absolutely arrest bleeding, and to remember that the pneumogastric may be pushed out of place by or be enclosed in the goiter. Trendelenburg of Bonn ties all four thyroid arteries, and has never met with myxedema. Krönlein employs extirpation. Rydygier of Cracow has tied the four arteries in 22 cases, and has

[1] Centralb. f. Chir., xxvii., 1895.

never had myxedema follow. Harsant very ably reviewed this subject in Bristol Med. Chir. Jour., Dec., 1895. The liability to sudden death after these operations is discussed in the *Year-Book* for 1896.]

Bland Sutton[1] reports an interesting case of **median cervical fistula** in the lower third of the neck. There was an opening through which mucus flowed, and a probe was introduced, passed upward in the middle line just beneath the skin, and stopped at the middle of the lower border of the basihyal. It was quite evident that this condition was a persistent thyroid duct. The parents said that it appeared when the patient was 3 years old. It ordinarily caused him no trouble, but during the last 2 years it seemed subject to catarrh, and the excessive flow of mucus caused him so much inconvenience that he was anxious for relief (Fig. 66). Mr. Sutton dissected out the duct. He found it

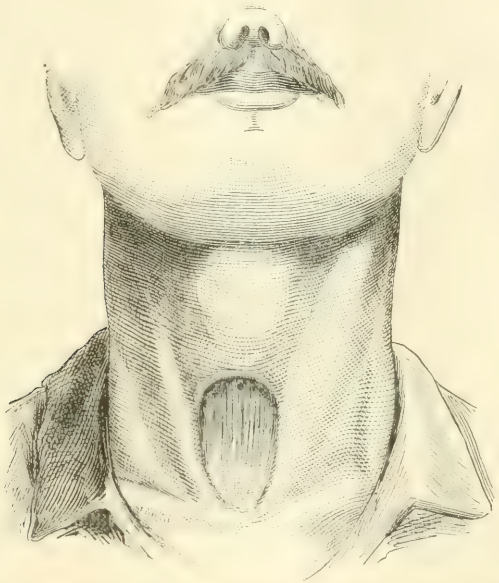


FIG. 66.—Median cervical fistula (Sutton, in Lancet, Nov. 9, 1895).

passed vertically upward beneath the deep fascia of the neck to the basihyal. Near its lower end the duct bifurcated, one arm ending blindly, the other opening on to the skin, as already described. The upward end of the duct passed behind the basihyoid, finally becoming incorporated with the thyrohyoid membrane. By introducing a probe into the duct at the beginning of the operation and keeping it there he was able to remove the duct entire. He sewed up the deep fascia by buried sutures of catgut and sewed up the skin with silk. This case illustrates well the chief features of the thyroid segment of the thyroglossal duct—its median position and relation to the basihyal, and the appearance of the fistula subsequent to birth. It is thus in striking contrast to branchial fistulæ, which are always lateral, in close relation to the sternomastoid muscle, and are always congenital. An examination of this

[1] Lancet, Nov. 9, 1895.

specimen showed that the duct was lined with typical columnar ciliated epithelium; goblet cells were present. The tissue forming the walls of the duct resembled atrophied thyroid tissue; here and there isolated acini lined with epithelium were detected. It is to be noted that the epithelium of the thyroid duct and of persistent branchial fistulæ is identical. This demonstrates that the thyroid duct is a real and tangible structure large enough to accommodate a probe; it is not a minute passage existing only in the embryo.

DISEASES OF THE MUSCLES AND TENDONS.

Buchanan[1] says **rupture of the tendon of the quadriceps extensor femoris** appears to be a rare injury or, at least, rarely recorded, a careful examination of literature disclosing but 120 cases. The most important papers yet published upon this subject are by Maydl of Vienna in 1883, Bull of New York and Hoffman of Berlin in 1889. Bull made a careful study of the cases collected by Maydl and himself, and arrived at the conclusion that when operative treatment was not adopted an imperfect result would occur in half of the cases. Buchanan says that this lesion furnishes the same indications for treatment as does fracture of the patella, but this indication is very difficult to fulfil by external appliances. The upper border of the upper fragment in transverse fracture of the patella furnishes an offset, over which can be looped the turns of muslin, plaster, leather, or other materials used to make traction upon the quadriceps muscle, and thus approximate the fragment; but in rupture of the quadriceps tendon no such purchase exists, and if we treat it without operation, we have to rely on rest in bed in the extended position, bandage of the thigh from above downward, and of the patella from below upward, and the posterior or immovable splint. This method of treatment is very inefficient, and statistics show that its results are poor. The proper treatment is to apply buried sutures through the incision. Buchanan then reports a case in which he obtained a most successful result, and tabulates the 10 cases which have so far been reported as operated on by open incision. The operative method should be recommended to patients.

Walker[2] elaborately discusses the entire subject, and makes an analysis of 255 cases with reference to treatment and the results. He tells us that under mechanical treatment 72.5% recovered completely—12.5% in 3 months and 32% between 3 and 6 months. Under the operative method 86% recovered completely—50% within 3 months and 36% between 3 and 6 months. Thus under the operative method there is a much larger percentage of complete recoveries and the duration of treatment is very much shortened, without any increase of mortality. He concludes that in recent cases without much joint-effusion, and when the joint is apparently not open, where the separated ends can be approximated and held by suitable mechanical adjustments, mechanical treatment can be considered, and in the great majority of cases it will bring about complete recovery, although from 9 to 12 months' time will be necessary to fully reestablish normal functions. Too prolonged retention in bed is unfa-

[1] N. Y. Med. Rec., Nov. 2, 1895.

[2] Am. Jour. Med. Sci., June, 1896.

vorable to early recovery, and early massage and passive motion are strongly advised. The skilful aseptic surgeon who resorts to primary operation in a suitable case may reasonably hope to obtain a better result in a larger number of cases, and save his patient from 3 to 6 months' time. Catgut, kangaroo tendon, or silkworm gut should be used, and when there is much effusion drainage should also be employed. Operation should always be undertaken when there is separation to a greater extent than $1\frac{1}{2}$ in. or when mechanical treatment has failed. In future the operative treatment will be more often indicated and more frequently applied.

Franke[1] outlines the operation of Nicoladoni for making up for a **defect in action of a paralyzed muscle** by dividing the tendon of this muscle and uniting the distal extremity of this tendon with the tendon of a normally acting muscle. This observer reports 2 cases of his own, and cites 15 others, in which this operation gave excellent results. In 1 case of pes equinovarus he cut the tendo Achillis, and found that the foot was still in dorsal flexion. The tendon of the extensor longus digitorum was severed and the distal portion was united by suture to the tibialis anticus. The child had previously been able to get about only with the aid of braces, but was now able to run and play without support. The second case, a child of 5 years, presented equinovarus, but after the performance of this operation was ultimately able to run about without the aid of braces.

G. G. Davis[2] reports 2 cases of rupture of the long head of the biceps muscle. These cases were associated with rheumatoid arthritis, and the patient was unable to place the distinct time at which the rupture had occurred. The cause of the rupture is that the tendons are weakened by the disease. The tendon ruptures and becomes absorbed, and this may occur early in the attack of rheumatoid arthritis, long before the marked change that one sees in the familiar illustrations in the text-books.

Injuries to the Tendons of Fingers.—Walkace[3] reports a case of a woman of 29, who found she was unable completely to extend the last phalanx of the middle finger of the left hand. A few hours previously she had caught her finger while pulling on her stocking, and had heard a snap, though she felt no pain. On attempting extension the terminal phalanx formed an angle of 135° from the rest of the finger. There was a tenderness and swelling over the back of the joint and some pain over the middle of the dorsum of the middle phalanx. A splint was applied and kept on for about 10 days, after which a splint with a spring which pressed back the terminal phalanx was kept on for a fortnight, producing an angle of 160°. [We know of a similar injury occurring in a physician in which the finger was 6 months in returning to a normal condition, and the joint was tender and weak for 2 years.]

Kidd[4] reports 2 cases of rupture of the terminal expansion of the extensor communis digitorum. The joints in the long run practically recovered power of expansion without any specially applied treatment. Thomas[5] reports a

[1] Med. News, May 23, 1896. [2] Ibid., Aug. 3, 1895.
[3] Lancet, Feb. 29, 1896. [4] Ibid., Mar. 28, 1896. [5] Ibid., May 9, 1896.

case of rupture of the terminal expansion of the extensor communis digitorum which was similar to those previously set forth. Walsham[1] writes on the treatment of dislocation of the tendon of the peroneus longus. He tells us that this accident may happen suddenly or gradually, and that the tendon slips from the gutter behind the outer malleolus and lies upon the outer surface of the malleolus. The condition causes much suffering and inconvenience, and the treatment by the application of pads is absolutely insufficient. Walsham opposes dividing the tendon for the purpose of creating adhesion to the sheath, because such a procedure destroys the function of the tendon. He makes a new sheath for the tendon, the sheath being composed of fascia and periosteum, which is lifted up from the lower end of the fibula. This flap is carried across the tendon and sutured to fibrous tissue back of the proper groove. This surgeon reports a successful case.

FRACTURES AND DISEASES OF THE BONES.

FRACTURES.

A form of splinting is strongly recommended by Edward A. Tracy[2] in an article designated **"The New Surgical Splinting."** It is composed of crushed wood-fiber rolled in a rugose fashion in which some fabric has been incorporated. This material may be readily moulded to fit any part. Before application it is moistened with water or with a solution of potassium silicate, the ordinary solution of silicate being taken after dilution with one-half its bulk of water. When moist the material is applied directly to the limb and bandaged so as to make it conform to the shape of the part. It is then removed and dried over the kitchen fire or a gas-jet, and it is reapplied to the limb before being completely dry.

Bardeleben[3] made a report on **early motion in fractures,** especially in the lower extremities. In the past year he has treated 58 cases, making a total of 181 fractures in which this method has been employed. A good result was obtained in every case. The time required for healing was shorter than when the patient is confined to his bed, and by this method there was escape from the danger of muscular atrophy from protracted disuse and bronchial catarrh from prolonged recumbency.

Krause[4] made a report upon the **ambulatory treatment of fracture.** He tells us that in fracture of the ankle the dressing should reach as high as the head of the tibia or even above the knee-joint. In fracture of the leg the dressing should be carried to the middle of the thigh, and in fracture of the lower end of the femur the dressing must be carried to the lower end of the pelvis. He keeps the patients in bed for one or two days in the beginning of treatment. In estimating the duration of treatment he concludes that there is no particular difference in duration between ordinary treatment and ambulatory

[1] Brit. Med. Jour., Nov. 2, 1895.
[2] Jour. Am. Med. Assoc., Jan. 25, 1896.
[3] Beilage z. Cent. f. Chir., 1895, No. 27.
[4] Centralbl. f. Chir., vol. xxii. p. 685, 1895.

treatment, in fractures of the fibula and in fractures of the leg the average duration being $38\frac{3}{4}$ days, the ordinary treatment requiring $47\frac{1}{2}$ days to obtain consolidation. In fracture of the leg, middle and lower third, the duration has been $41\frac{3}{5}$ days up to consolidation; under the older methods of treatment it was $71\frac{1}{2}$. He calls attention to the fact that the period at which the plaster bandage has been removed has not always corresponded with that of consolidation. Instances of delayed union occasionally happen during this ambulatory treatment, especially in 1 case of complicated fracture of the leg in a laborer 62 years of age, where consolidation was delayed to the 115th day, but in most instances consolidation was more rapid than usual.

In the Congress of French Surgery[1] Heydenreich gave a resume of the **operative treatment in recent fractures.** He was not disposed to strongly advise operative treatment in recent simple fractures.

Berger stated[2] that in simple fracture of the shafts of most long bones operation had not been proposed with seriousness. It was proposed for broken clavicle and broken leg. Berger opposes suturing the clavicle unless injury of the nerve or vessel complicated the injury of the bone. He considers that ordinary treatment gives satisfactory results. Operative treatment is followed by a scar which is itself decidedly objectionable, and is apt to be attended by considerable swelling because of the formation of callus. He states that when we are dealing with an oblique fracture of the leg no apparatus is known which will ensure union without shortening. Berger thinks that suturing these bones together would fail to overcome the shrinking which arises because of obliquity of the fragments and the action of the flexor muscles; and he thinks, further, that not only would osseous sutures fail to correct the difficulty, but would be fraught with considerable risk. It is a well-known fact that when bones are sutured there is likely to be an excessively sensitive callus, and the leaving of metallic sutures in bones may lead to grave troubles. He thinks that even in the worst forms of simple fracture of the leg we should content ourselves with careful management as to details. The plaster-of-Paris apparatus should never be applied immediately, and reduction should be brought about gradually and not attempted suddenly, and an immovable dressing should be applied when reduction is complete. The only cases in which Berger thinks a surgeon is justified in making an incision, replacing the fragments and suturing them, is when the inability to effect reduction is due to the presence of loose bone or portions of muscle, periosteum, or ligament between the fragments. Berger says that in articular fractures those only in which operation is justifiable are about the elbow and knee, because an imperfect result here means a most grave functional loss. He very greatly doubts whether the functional result could be improved if we were to suture the fragments of a fracture of the elbow-joint. In fracture of the condyles of the femur suture is more certainly indicated, but the dangers which arise from infection of the knee-joint are so great that he does not advise operation unless the displacement positively resists reduction and is very marked. Berger of course excludes in these remarks

[1] Reported in La Semaine méd., Oct. 26, 1895. [2] Méd. moderne, Nov. 2, 1895.

operations upon the olecranon and the patella, which are very frequently advisable. [Reynier opposed Berger's contention that a fracture of the clavicle should not be sutured, and maintains that the operation is not unusually indicated, especially in women. Beeckel stated that in some cases of fractured clavicle nothing but suture could secure even a fair result, and Demours and Villar agreed with him, asserting the same to be true of the lower jaw. Two recent cases were sutured by Hearn in the Jefferson Hospital in which it was found impossible to correct the deformity before operation. The fragments were disentangled and were sutured with kangaroo tendon, and the skin was closed with a subarticular stitch. The result in each case was admirable: deformity was absent, there was complete use of limb, scar was so slight as to be scarcely visible, neither scar nor callus was painful. When reduction of the deformity cannot be accomplished by posture and manipulation, when reduction cannot be maintained by the use of an apparatus or confinement in bed, when pressure is being made by the fragments upon the great vessels or nerves, when the fragments threaten to perforate or have perforated the skin,—suturing should be performed, and we should use kangaroo tendon, as did Hearn.]

Viana[1] in making a **diagnosis of fracture** in difficult cases suggests the old idea of Lisfranc of employing **auscultation.** The surgeon places the stethoscope near the supposed fracture and makes percussion adjacent to the stethoscope. This percussion should be made with a hammer and plexímeter, and is carried along the bone. At the minute it is applied over the seat of fracture a decided change in the resonance is easily noted. This method of diagnosis is said to be of value in fracture of a bone of an extremity, the skull, and a rib.

Harte[2] writes upon **epiphyseal separation of the lower end of the femur,** and reports 5 cases of this rare and interesting accident. Hamilton only saw 1 case of this injury.

Stokes[3] regards the diagnosis of **fractures of the upper third of the femur,** including the neck, as frequently very difficult. When we remember that at times many of the signs and symptoms of fracture may be present without a fracture, and that, on the other hand, fractures may exist without many of the signs and symptoms, it becomes obvious that diagnosis is difficult. There is no group of fractures in the vicinity of the joint in which there is a greater variation in the size. In the majority of cases there is some shrinking of the limb. In others this is scarcely perceptible, and in one form it has been said that slight lengthening may occur. In most cases there are eversion and abduction of the limb, but in others there is neither one nor the other. In the third group there are inversion and adduction. In some there is pain; in others there is freedom from it. Immediate shortening is the rule in fractures of the cervical base, but frequently in fractures of the cervix shortening is of secondary development. In fractures of the base impaction occurs in some cases, and is absent in others. In fractures of the cervix proper we do not have impaction, but have penetration. In some cases the fracture results from fall-

[1] Gaz. degli Ospidali, No. 63, 1895. [2] Am. Jour. Med. Sci., June, 1896.
[3] Brit. Med. Jour., Oct. 12, 1895.

in other cases the fall results from the fracture. In some cases exuberant bone-growths occur; in other groups absorption of bone takes place. Death from hemorrhage in fracture of the bone has been observed by Cruveilhier, R. W. Smith, Vidal, and others, but it has not been observed in connection with fractures of the cervix. Comminution is a frequent complication in one group, and is rarely if ever observed in the other. Fractures of the cervix take place, as a rule, in the more advanced periods of life, although Sutton has shown that in rare instances they may occur even before the junction of the epiphyses. The most serious of these injuries often results from trivial force; a less serious fracture may result from greater force. All of these circumstances prove the truth of the dictum of R. W. Smith, that each particular symptom of fracture of the neck of the femur, separately considered, must be looked upon as equivocal; the union of all can alone lead to the formation of a correct opinion as to the nature and seat of the injury. Most of the modern surgical text-books fail to allude to the important anatomic structure connected with these fractures—that is, to the fibrosynovial envelope of the cervix, the so-called cervical ligament of Stanley and Smith.

Stokes publishes a table of what he thinks should be the accepted classification, adopting many of the subdivisions of intracapsular and extracapsular fracture suggested by the late Prof. Gordon of Belfast. He thinks that a distinction should be made between fractures with and without penetration and fractures with and without impaction—such a distinction as was made by Prof. Chiene in connection with fractures of the lower end of the radius. This classification was made from specimens belonging to the museum of Queen's College, Belfast, and pictures of the different ones are contained in the article:

Fracture of Cervix Femoris (Intracapsular).

I. Fracture with penetration of cervix into head.	With penetration.
II. Fracture with reciprocal penetration.	
III. Intraperiosteal fracture of cervix at junction with head (transverse).	Without penetration.
IV. Intraperiosteal fracture at center of cervix (transverse).	
V. Extraperiosteal fracture with laceration of cervical ligaments.	

Fracture of Base of Cervix Femoris (Extracapsular).

I. Fracture of base of cervix with partial impaction (posteriorly).	With impaction.
II. Fracture of base with complete impaction.	
III. Fracture of base with partial impaction above (angle obtuse).	
IV. Fracture of base with partial impaction below (shaft split).	
V. Longitudinal splitting of cervix.	Without impaction.
VI. Comminuted fracture without impaction.	

Among the fractures of the cervix there is no doubt that the fifth variety is the one that is most frequently met, and the one in which osseous union, owing to deficient nutrition, nonapposition of the fragments, synovitis, effusion of blood, and rapid interstitial absorption, never takes place. The frequent occurrence of this result doubtless caused the late Sir Astley Cooper and others to fall into the error of maintaining that osseous union never occurs in any intracapsular fracture. We now know that in a considerable proportion of these cases osseous union is obtained. The speaker then showed some beautiful examples of this from the museum of the College of Surgeons and from the museum of the Royal University of Ireland and that of Queen's College, Belfast. Osseous union will occur when the cervical ligament is intact and when one of the two forms of penetration exist; that is, penetration of the cervix into the head, or reciprocal penetration. It therefore appears that there are four different forms of fracture of the cervix in which bony union is possible, provided the usual routine expectant treatment is abandoned. It may with truth be held that the farther from the base of the cervix the lesion is, the less is the chance of osseous union, because the nearer we get to the head of the bone, the more profoundly is nutrition affected, because the nutrition of the parts near the head is chiefly derived through the cervical ligament, which is, as a rule, more or less torn or contused. In injuries high up in the cervix the difficulty of maintaining fixation or rest is more prominent, owing, among other things, to the rarity of penetration which is observed the nearer the lesion is to the head. In the second group of fractures of the cervical base impaction in some form or other is the rule, and the amount of eversion depends upon the amount of impaction. The most usual is impaction of the posterior cervical wall into the cancellous structure underneath the posterior. The theory that the eversion is due to rotation of the shaft upon the base of the neck is, according to some, untenable, they holding that it is due to the rotation of the base of the neck upon the shaft. The occasional occurrence of inversion in both groups of fractures of the cervix and its base is more difficult to explain. Guthrie held that this unusual condition was confined to the extracapsular forms of fracture when the great trochanter or a portion of it remained continuous with the shaft of bone, but Guthrie's statement has been proved an error, as the condition has been observed in fractures of the cervix within the capsular ligament. The late Professor Pirrie published a very remarkable case of inversion of the limb in a case of fracture of the cervix close to the head at right angles to the axis of the neck. The patient died 6 weeks afterward. Postmortem showed that the capsular and iliofemoral ligaments were uninjured, and Prof. Pirrie attributed the deformity to the tension of these ligaments. This does not seem to Sir William Stokes to satisfactorily explain this condition.

R. W. Smith held that when inversion arose it was due to the altered action of the adductors, which became rotators inward, owing to the lower fragment being displaced in front of the upper, so that the insertion of these muscles was in a plane anterior to their origin. If muscular action were the cause, how-

ever, the inversion would continue constant, but such is not the case. It occasionally happens that inversion is well marked, and a day or two later the usual eversion supervenes. Stokes thinks that the inversion is most probably due to the limb having been adducted and inverted at the time of the accident, and that afterward the limb remained in the position it was at the time injury was received.

Fracture of base of cervix (extracapsular).	Dislocation on dorsum ilii.	Fractures of the brim of acetabulum.	Fractures of fundus of acetabulum.	Contusion.
Common in advanced life.	Rare in advanced life.	. . . . .	. . . . .	Relation between anterior subspine and trochanter on both sides, the same at first.
History of direct fall on trochanter.	History of forced rotation inward of femur.			
Shortening.	Shortening greater.	Shortening.	Shortening.	Preexisting chronic rheumatism, a cause of great difficulty in forming a right estimate of the case. Note the previous history, and observe that the powerless state induced by the injury soon passes off.
		Shortening recurring after extension is removed.		
Eversion usual.	. . . . .	Inversion.		
Inversion rare.	Inversion constant.			
Inversion slight (Guthrie).	Inversion well marked.	Power of eversion.		
		Adduction.		
Movements comparatively easy.	Movements difficult and restrained.	Power of widely abducting limb.		
		Flexion of knee.		
Head in acetabulum.	Head on dorsum ilii.	Head drawn upward and backward, with detached fragment at brim.	Head passes into pelvis.	
Outer surface of trochanter, looking backward.	Approximation of trochanter to anterior subspine.	Crepitus.	Fracture comminuted, star-shaped.	
Pain along line of fracture in front, above, and behind.	No pain on pressure over trochanter.	. . . . .	Liability to formation of abscesses in iliac fossa.	
Diminished tension of extensor muscles (Lagoria).	Increased tension.	. . . . .	Accident generally fatal.	

There is no part of the subject more important than a differential diagnosis, as the patient's future and the surgeon's reputation depend upon a correct estimate of the condition. Fracture of the cervix may be mistaken for luxation on the dorsum ilii, fracture of the brim of the acetabulum, fracture of its fundus, and contusion. The differentiation may generally be made by bearing in mind that in fracture we have usually a history of a direct fall on the trochanter, followed by eversion, shortening, and backward dissection of the outer surface of the trochanter, occurring in advanced life, with marked pain along the line of fracture, diminished tension of the extensor muscles, and occasional inversion; that in a dislocation we have a history of forced internal rotation; that dislocation is rare in advanced life, shows great shortening,

usually inversion, approximation of the trochanter and the anterior superior spine, the presence of the head of the bone on the dorsum of the ilium, difficult and restrained movements, absence of pain on the trochanter, increased tension of extensor muscles, and constant and decided inversion. In fractures of the brim of the acetabulum we have the head drawn upward and backward, with a detached fragment of the brim, shortening, inversion, crepitus, adduction, recurrence of shortening after extension is removed; we furthermore have the power of eversion and abduction of the limb. In fractures of the fundus comminution is usual. When a head passes into the pelvis shortening is noted, there is a liability to abscess-formation, and generally a fatal result. In contusion the normal relations between the anterior superior spine and the trochanter are at first preserved, though ultimately are often lost. The knowledge that chronic rheumatism preexisted often adds to the difficulty of a differential diagnosis. The preceding table of differential diagnosis is of value.

From all considerations Stokes thinks we are justified in forming the following conclusions.

1. The alleged senile alteration in the angle between the axis of the cervix and the shaft of the femur does not occur, and cannot therefore be regarded, as it has hitherto been, as a predisposing cause of fracture of the cervix femoris.

2. That the process of absorption in the case of fracture is probably due primarily to senile osteoporosis, and secondarily to the twofold action of the absorbents on the one hand and friction of the broken fragments on the other, and, in the case of contusion, of impaired nutrition consequent on a low form of synovioperiosteal inflammation.

3. That in classifying fractures of the cervix or its base a distinction should be made between those with and without penetration and those with and without impaction.

4. That osseous union may take place in 4 out of the 5 different forms of fracture of the cervix femoris.

5. That the farther the fracture is from the base of the neck the less is the probability of osseous union.

6. That fracture of the cervix may occur previously to epiphyseal junction.

7. That the differentiation of these injuries lies between fracture of the cervix or its base, luxation, fracture of acetabular brim or acetabular fundus, and contusion.

8. That the principles of treatment should be fixation, rest, and moderate extension.

The paper of Southam alluded to in the previous article by Stokes[1] is designated "**The Treatment of Impacted Fracture of the Neck of the Femur** by Breaking down the Impaction under Anesthesia." In his first paper[2] he called attention to the unsatisfactory results which attend the usual method of treating impacted extracapsular fracture of the neck of the femur. This treatment consists in keeping the limb at rest and making no attempt to correct the deformity. The result is that the patient remains for life with a limb that is shortened and everted. He describes the case of a man of 27, in which the fragments were forcibly loosened while the patient was under anesthesia and the deformity corrected, with the result that perfect union took place. He reports in this paper 3 cases which have recently been treated by the same method in the Manchester Royal Infirmary (2

[1] Lancet, Dec. 21, 1895. [2] Ibid., Nov. 17, 1894.

under the author's care and 1 under Mr. Whitehead's). The result in each case was satisfactory. The patients were aged respectively 50, 75, and 65 years. These cases illustrate the fact that advanced age is no bar to this procedure, the fracture in each instance readily uniting, with abundant formation of callus, after the breaking down of the impaction.

Barker [1] discusses the permanent **subcutaneous method of wiring the patella** for fresh transverse fracture. The method has given him great satisfaction. In order to get the best results certain measures of general treatment are necessary, and certain details in the application of the suture must be carefully attended to. This operation is of course only suited to recent fractures, and it should be done as soon as possible after the injury. Passive motion, even slight active motion, is permitted immediately after the operation. In his earlier cases Barker splinted the limb for a few days. He has now abandoned this procedure, and thinks it even harmful, except in patients who are drunk or who are suffering from delirium tremens. The patient is told that he can move his leg about in the bed as much as he likes if it is not painful. In addition to this, the surgeon daily makes passive flexion. Massage is begun the day after the operation, and is continued for a couple of weeks. The material employed for suture is silver wire. Silk was used in 2 cases, but it was found difficult to obtain a close and tight approximation with silk.

"The wire I have always employed is of soft silver. In thickness it is just equal to a No. 1 silver English catheter. The exact thickness by wire scale I do not know, but this measurement is accurate enough. A piece of this about a foot long should be straightened, and then softened by heating in a spirit flame.

"And now as to the adjustment of the fragments. Before the wire is introduced the operator takes each fragment between the finger and thumb of opposite hands. He always stands on the patient's right side. He then proceeds to rub the fractured surfaces one against the other, which in fresh fractures is easy enough. Thus rubbing them from side to side, he is soon conscious that he has dislodged all blood from between them or clot and fibrous material, and that they grate one against the other like dry lumps of sugar. When he gets this sensation he is ready to introduce the wire. Then, while he is preparing to close the wire on the fragments as above, his assistant repeats the rubbing process, and finally brings the fractured surfaces accurately together, with special care that the external and internal edges correspond and that there is no rotation of either on its vertical axis. The closing of the wires keeps them in the same plane, one passing over the front and one over the back of the fragments. Then the wires are twisted as above. Care should be taken that the first twist should not be too sharp, lest the wire be snapped. This occurred in one case with a thinner wire, and I had to introduce a second wire. The second and third twists will tighten the first.

"And now let me once more briefly describe the steps of the operation, bearing in mind the emphasis to be laid upon the matters of principle and detail mentioned above:

"First, everything about the field of operation and the instruments, etc. is made aseptic. Then the lower fragment is steadied between the operator's left finger and thumb, while a narrow-bladed knife is thrust exactly through the middle of the upper attachment of the patellar ligament, with its edge upward cutting on the bone. When the blade has entered the joint it is withdrawn, still cutting on the lower edge of the lower fragment, and enlarging the skin wound upward to the extent of two-thirds of an inch. Through this opening a special long stout-handled needle, without any wire (Fig. 67), is now thrust into

[1] Brit. Med. Jour., Apr. 11, 1896.

the joint behind both fragments, and is made to pierce the tendon of the quadriceps close to the upper edge of the upper fragment, exactly in the middle line of the fragment. When its point appears under the skin it is cut down upon with the knife, whose edge



FIG. 67.—Needle specially designed to carry a thick wire. The eye is drilled obliquely, and should receive only a little loop on the end of the wire; this little loop should be made previously (*vide* Figs. 68 and 69) (Barker, in Brit. Med. Jour., Apr. 11, 1896).

should now be turned downward and enter the joint beside the needle, cutting upon the upper edge of the upper fragment, so as to leave nothing between the needle and the bone. A stout silver wire (*b*) is now threaded through the eye of the needle (Fig. 68), and the

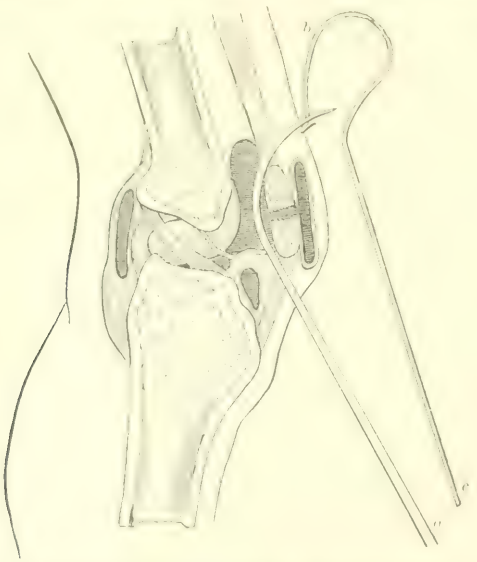


FIG. 68.—Needle (*a*) introduced behind the fragments, and receiving one end (*b*) of the silver wire (*b*, *c*) (Barker, in Brit. Med. Jour., Apr. 11, 1896).

latter is withdrawn and then unthreaded. The empty needle is then again thrust through the same lower opening, but this time in front of and close to both fragments, until it emerges through the upper puncture. Here it is threaded with the other end of the wire (*c*), and is withdrawn (Fig. 69). Both ends of the wire now emerge by the lower opening. I then thread each through holes in the center of short metal bars (Fig. 70) for the convenience of pulling, and fix their respective ends to the bars by a second transverse threading. Then the posterior wire is drawn upward and the anterior downward, as described above (Fig. 70). When the fragments are adjusted the bars enable the surgeon to make a powerful even strain on the wires and twist them as above accurately. While the wires are in situ, but before they are twisted, all the blood in the joint should be squeezed out by pressure with the hands and kneading. The whole operation should not take more than five minutes from beginning to end.

Cox[1] offers some considerations in regard to the **operative treatment of fracture of the patella.** He maintains that there are some cases which

[1] Ann. of Surg., Dec., 1895.

obviously do not require operation. If in 24 hours the joint is found much distended, we should operate and open the joint. The operation he prefers is to bare the bone and suture the fragments with catgut. He thinks that either

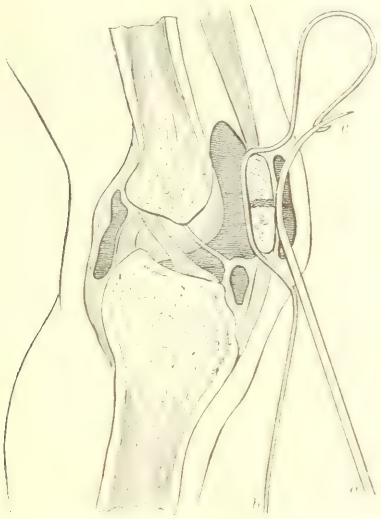


FIG. 69.—Needle (*a*) passed in front of the fragments, and receiving the other end (*c*) of the silver wire (*b*, *c*) (Barker, in Brit. Med. Jour., Apr. 11, 1896).

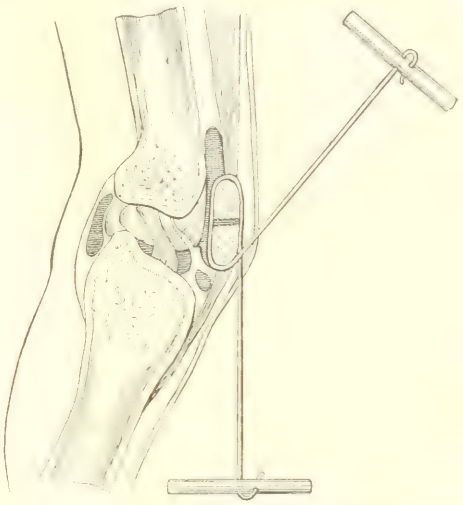


FIG. 70.—Wire in position round fragments and threaded through metal bars. The lower and posterior wire runs upward to the left of the upper ready for twisting (Barker, in Brit. Med. Jour., Apr. 11, 1896).

silk or silver wire, if employed as a suture, is likely to lead to subsequent trouble, to sinus-formation or to caries. He uses catgut which is reinforced by the sustaining external dressing. The spasm disappears after 48 hours, and catgut will not be absorbed for certainly 4 or 5 days. The joint should not be washed out with any irritant antiseptic, not even with distilled water, for irritant antiseptics or distilled water injures the joint-endothelium and interfere with nutritive activity and the energy of the lymphatic system, and hence actually predisposes to subsequent infection. Influenced by McBurney's paper upon the use of normal salt-solution, he has been led to employ this in washing out the joint.

White,[1] as regards the Operative Treatment of Fracture of the Patella, inquires—1. Are the results obtained by the ordinary methods of treatment satisfactory? and he decides that in most instances they are not. He inquires —2. What are the causes of failure? The alleged causes of failure may be divided into 3 classes: 1. The separation of the fragments by the contractions of the quadriceps and the presence of fluid within the joint; 2. The atrophy of the quadriceps, which Von Bergmann believes is due to the pressure of the dressings employed and to disuse. This is responsible for some of the cases in which it is impossible to extend the limb; 3. The cause which Macewen believes is the chief one, the interposition of fibrous and aponeurotic structures between the fractured surfaces. White used to think that Macewen's expla-

[1] Ann. of Surg., Nov., 1895.

nation was the correct one, and that the only rational treatment was to open the joint and elevate the soft parts. The other conditions can be met by simpler and safer means. The exudation in the joint may be removed by aspiration. The fragments can be brought together and held in position by bandages or by Malgaigne's hooks. If Macewen had been mistaken in assigning to the influence of the prepatellar structures the majority of cases of non-union, the aseptic use of Malgaigne's hooks would be the most rational method of treating transverse fracture of the patella. In 1891, Barker introduced his operation, which White has adopted in a number of cases and has found most satisfactory. He has not invariably gotten bony union, but has done so in the great majority of cases, and in 1 case only has there been extensive separation of the fragments resulting. In estimating the comparative value of methods of treatment the danger to life should exert a predominant influence over our selection, and this danger is undoubtedly greater by wiring than by any other plan of treatment; and it is this fact which causes careful surgeons to hesitate in recommending its employment.

A few years ago Dennis compiled a table of 186 cases subjected to wiring. In this group there were 34 cases in which suppuration occurred, 4 in which amputation became necessary, 24 in which the result was poor, and 11 cases terminated fatally; 35 were marked as ending with a fair result, 17 of them having partial ankylosis. The opposition among surgeons at this period of time was very strong, and the procedure was condemned by Bryant and Adams, Henry Morris, Edmund Owen, and other prominent authorities. As late as 1887 we find Barker, Thomson, Stokes, and Robson opposing indiscriminate performance of the operation. White believes that with proper care Barker's operation meets the indications, and that along with a *reasonable degree* of safety it gives far better results than do other methods.

Keen[1] reports 3 cases of **wiring the patella for old fracture.** In these cases the fragments were very widely separated, and in order to approximate them it was necessary to divide the quadriceps muscle, and in 2 of the cases to also chisel loose the tubercle of the tibia. The result in each case was excellent. Keen concludes that these cases are strong arguments in favor of a combined triple operation of wiring the fragments, cutting the quadriceps, and chiselling the tibial attachment of the ligamentum patellæ when the two fragments cannot otherwise be brought into apposition. No reaction of a troublesome nature ensued in any case, and the only unfavorable point was in connection with the section of the quadriceps at the upper end of the incision. To obviate this he suggests the following modification of technic. He says, first, that he will hereafter make a flap of skin beginning on a level with the upper border of the patella and extending downward an inch below the tubercle of the tibia. When this flap is dissected up, the operative procedures can be undertaken as usual, and then the line of union of the patella and the wire and the point at which the tubercle is chiselled loose will not be exposed to possible infection or other accident by lying immediately beneath the line of

[1] Ann. of Surg., Nov., 1895.

incision, but will be entirely covered by a solid flap. If it is necessary to divide the tendon of the quadriceps or of the rectus alone above the patella, this may be done by an entirely independent incision, which can be drained if need be, and the possible contamination of the knee-joint by accumulation of blood-clot through the long incision will thus be avoided.

Phelps[1] concludes that the **obstacle to union** is usually the intervention of the anterior capsular fibers, which get between the fragments, and that this obstacle in most cases cannot be removed without opening the joint; that opening the joint is free from danger; and that by this operation we invariably obtain osseous union in less than half the time required for ligamentous union by other methods. Careful after-treatment means restoration of the functions of the joint, and with the surgeon of ordinary operative skill this is not an operation of choice, but of obligation. [Fowler maintains that before operating we should wait until the injured soft parts have regained a normal standard of nutritive activity, the waiting period being used to asepticize the skin about this region—skin notoriously hard to cleanse because of



FIG. 71.—1, 1, Plaster splint as applied to leg: 2, upper border of splint pressing lower fragment into position; 3, lower fragment with line of fracture above (Bryant, in Med. News, Jan. 7, 1893).

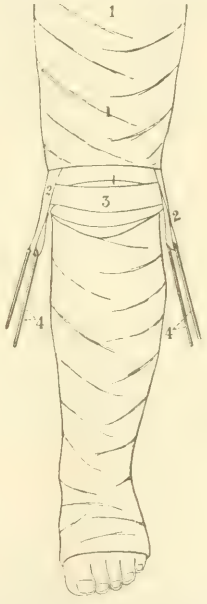


FIG. 72.—1, 1, Extension as applied to thigh; 2, 2, front view of extension straps; 3, adhesive straps retaining fragments in position; 4, 4, rubber extension made taut while adhesive straps are being applied (Bryant, in Med. News, Jan. 7, 1893).

its thickness and the number of creases. Fowler disapproves of wiring (suture through fragments) and tying (suture around the fragments), but after cleaning the ends of the fragments he brings them in contact by fixation-hooks. Fowler does not irrigate the joint, closes the wound without drainage, and applies a plaster cast (see Annals of Surgery, 1895, xxi. No. 6).]

[In many cases of fractured patella careful mechanical treatment will give

[1] Yale Med. Jour., Dec., 1895.

a satisfactory result. Bryant has devised a most useful apparatus which gives continuous extension and allows the patient to be out of bed. Bryant's article was originally published in the Medical News for Jan. 7, 1893. The illustrations (Figs. 71–74) will make the principle of the apparatus evident. A plaster splint is applied to the leg so as to press into position and hold there the lower fragment (Fig. 71). When this splint has hardened the remainder of the apparatus is applied. An extension apparatus made like Buck's exten-



FIG. 73.—1, 1, Plaster bandage applied around thigh extension; 2, 2, rubber extension in position and action; 3, patella-retaining straps; 4, 4, hooks for rubber extension bands (Bryant, in Med. News, Jan. 7, 1893).

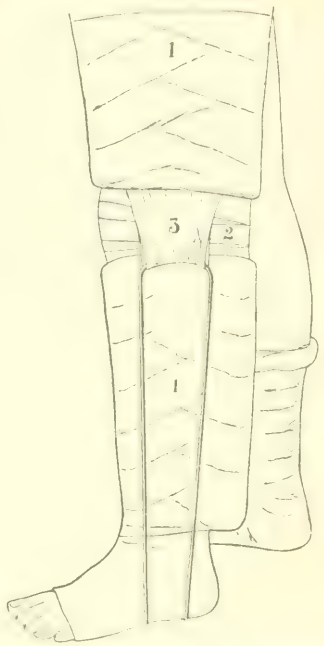


FIG. 74.—1, 1, Upper and lower segments of interrupted splint; 2, posterior support of splint covered by retaining straps; 3, side view of extension strap (Bryant, in Med. News, Jan. 7, 1893).

sion is placed upon the thigh. It reaches from the perineum to the upper border of the upper fragment (Fig. 72). The fragments are now strapped with plaster, the strips being fastened behind to a wooden support (Fig. 72). The fragments are thus drawn well together and supported. While the strips are being applied traction should be made upon the thigh. The next step consists in fastening the posterior support (Fig. 73) in place by means of plaster-of-Paris bandages. We thus form an interrupted plaster splint with a posterior connecting brace. The patient is permitted to walk about upon crutches, the limb being a little flexed and being supported by a long string from the neck.]

DISEASES OF BONE.

An interesting **osteoplastic operation** for loss of substance of the tibia is reported by Lilienthal.[1] There had been a considerable loss of substance

[1] Med. News, Apr. 4, 1896.

in the tibia from injury to the fibula, which remained intact. Ten months after the injury Lilienthal operated by sectioning the fibula and carrying the upper end of the lower fragment of the fibula against the lower end of the upper fragment of the tibia, and suturing it in position. He obtained an excellent result, which was well shown by a skiagraph.

Battle[1] writes a valuable article upon the treatment of **acute inflammation of bone** and its joint-complications. Clinically, 3 groups of these cases are recognized: 1. Those cases which are almost certainly fatal from the first, owing to the general infection. If life is prolonged more than 3 or 4 days the bone-inflammation may be localized as the signs of it have time to develop, but sometimes the bone-disease can only be found, even after death, by a careful search; 2. Those cases of a mild type in which there are evident local symptoms of bone-inflammation, but in which the general disturbance is slight, and in which under appropriate treatment recovery may ensue without any operation. The bone may become thickened in the region of the epiphyses, and lengthening may follow from overgrowth; 3. The third group contains the larger number of cases. The great feature of this group is that treatment may be successful even in the most severe conditions. In some of them there is great danger of pyemia, but in all of them much can be done to prevent it. In the worst cases there is a danger of joint-infection, of involvement of more than one bone, of extensive necrosis of the bones attacked, and of death from hectic or from amyloid disease caused by the prolonged suppuration. The patients are young, however, and it is often possible to save both the life and limb even in desperate cases. The most marked symptom is pain accompanied by fever. The pain is not easily localized at first, but it gradually increases in intensity at night, so that the child cannot sleep or move or permit any one to approach without cries of apprehension. Swelling and edema soon appear, and are most marked near the epiphyses. There is agonizing tenderness, and delirium soon sets in. In severe cases the aspect of the child is characteristic. There is a look of utter, hopeless misery and suffering, and the pale drawn face with sunken eyes looks years older than it should do. The pain is out of proportion to what could occur in any disease with which a physician might confound this condition.

Battle has seen cases sent to the hospital for treatment of acute bone-inflammation when there was nothing more serious the matter than lymphangitis, cellulitis, or erythema nodosum. The mistake, however, is usually committed in the other direction. The disease is sometimes mistaken for acute rheumatism, and the patient is treated with rheumatic remedies until irreparable mischief has been done. The condition of joint-disease which most closely simulates an acute inflammation of bone with secondary involvement of the joint, such as that we have been considering, is gonorrheal arthritis; but that is an involvement of later life. Having once come to a conclusion that we are dealing with a case of acute inflammation of bone, energetic treatment should be begun at once. Leeching the part, following this by the application

[1] Lancet, Nov. 30, 1895.

of hot fomentations, the use of a splint, and the administration of a purgative, will sometimes relieve or arrest the disease. If this treatment fails to abate the symptoms, or if the patient is not seen until the suppuration has begun, an incision should at once be made through the periosteum at the area of greatest tenderness. Usually there will be a flow of turbid fluid or of pus, but if not, the periosteum should be separated in the direction of the epiphyseal line, when the fluid will escape. In many instances the application of a trephine to the diaphysis has been most advantageous. Not only will early operation limit or prevent necrosis, but it will also sometimes prove effectual in saving a neighboring joint from invasion. The surgeon must never wait for fluctuation. Battle then reports 8 cases of extreme interest and practical importance.

Macnamara[1] deals with **infective and tubercular osteitis as causes of arthritis** in childhood and the importance of their early treatment. The paper is a careful study of the subject, and will well repay perusal.

Von Bergmann[2] has had an experience with over 150 cases of **acute osteomyelitis.** He advises free incision of the soft parts, the opening of the bone itself, and the removal of all infected areas. Not only should the medullary cavity be explored, but also the cancellous ends of the bones. When the general symptoms are of great severity and the medullary cavity is filled with miliary abscesses, total resection of the bone must be done. In some instances after resection of the sheath of the long bone there will be insufficient regeneration, and to get about the patient will have to depend upon an apparatus, but this is better than death. [In the Prague Clinic Funke[3] studied 664 cases of osteomyelitis. The most frequent assigned causes were traumatism and cold. Only 56 of the patients were over 25 years of age. Funke believes that recurrent osteomyelitis means a new infection, and does not mean that organisms of the previous attack have remained latent in the part. Of the cases 37 were examples of multiple osteomyelitis. Funke says multiple osteomyelitis occurs only in young subjects, and chiefly in bones not completely developed.]

Neuber[4] writes of a method of treating **cavities in bone** which are left after the removal of sequestra or other operations. In all these cases he uses an emulsion of iodoform and starch. This mixture is made by taking 10 g. of wheat starch, mixing it with a very little cold water, and adding to it 200 g. of boiling 2% phenol-solution and 10 g. of iodoform, very thoroughly stirred. When this mass cools it is of the consistency of jelly, and will melt at the temperature of the room. This is introduced in the bone-cavity with excellent results. Neuber reports 22 cases, of which he obtained immediate union in 19. [Bone-cavities may be filled by means of decalcified bone chips (Senn), blood-clot (Schede), turning in skin and fastening it to bone with nails, formalin-gelatin (Schleich), bone-grafts, periosteal flaps, ivory, cement, celluloid,

[1] Lancet, Dec. 7, 1895. [2] St. Petersburg. med. Woch., 1895, No. 17, p. 151.
[3] Verhandl. der Deutsch. Gesellsch. f. Chir., XXIV. Kongress, 1895.
[4] Aerzt. Rund., Oct. 15, 1895, p. 657.

plaster of Paris, metals, a copper amalgam (Glück). Cavities after the removal of sequestra may be treated after the plan of Ercole. This consists in breaking down the lateral walls and making the upper and lower walls an inclined plane. The periosteum is preserved and sutured. The posterior portion only of the bone remains to give support. Barth has shown that after living bone has been transplanted it undergoes anemic necrosis and new live tissue takes its place; but the transplanted bone does not live. Dead bone is as useful as living bone in filling a defect, and so is bone which has had its animal matter destroyed by heat.]

Parsons[1] presents an elaborate study of **posttyphoid bone-lesions.** Attention was called to this subject particularly by the Toner lecture of 1876, in which Keen quoted 41 cases of bone-disease following continued fever, 37 of which cases had followed typhoid fever. With the identification of the bacillus of Eberth as the specific cause of typhoid fever has come a more careful study of the nature of these bone-lesions, with results which prove a relation between them and the primary typhoid attack. Some of them seem to be due purely to the bacillus of Eberth; others are associated with the action of pyogenic cocci. He reports 5 cases presenting different aspects of the condition, and in all but 1 of these cases the pure culture of the bacillus of Eberth was obtained. All but 1 of these cases demanded operations. Radical operation is usually necessary in order to remove all of the diseased area, and simple incision and drainage are rarely curative. This disease may arise a long time after the termination of the fever, from 10 to 18 months, and before the attack fully announces itself there may be a long period of quiescence. The symptoms are discussed by Parsons, and he tells us that they are at first more or less intermittent, and later become more positive and localized. The diagnosis of these cases rests largely upon the history of the previous typhoid fever. The occurrence during or after convalescence is suggestive purely of typhoid cases. The prognosis is good, as a rule.

INJURIES, DISEASES, AND DISLOCATIONS OF THE JOINTS.

INJURIES AND DISLOCATIONS.

Biddle, who has had an enormous experience with **sprains,** read a paper upon sprains and their treatment before the Alumni Association of Jefferson College. After a description of the nature and diagnosis of sprains, he considered the relative frequency of sprains in each articulation and discussed their treatment. In speaking of sprains of the vertebral column, he stated that when the symptoms are local, when there is neither paralysis nor sensory disturbance except at the point of injury, when the functions of the kidneys, bladder, and rectum are unimpaired, it is certain that the cord has escaped damage; but even if the cord has escaped damage, there might be extravasation of blood into the vertebral canal, inflammation of the fibrous structure about the meninges or cord, so leading to degenerative lesions in the cord itself. The best way to avoid such results is to insist upon absolute rest upon a hard

[1] Ann. of Surg., Nov., 1895.

mattress for from 4 to 6 weeks. In cervical sprains large sand-bags should be applied on each side of the head and neck and a low pillow is used. Pain is allayed by the administration of 10 gr. of Dover's powder every 3 or 4 hours, and in these cases he likewise administers 20 to 30 drops of fluid extract of ergot 3 to 4 times daily. In chronic cases rest and massage with chloral and compound soap liniment once a day, and small increasing doses of potassium iodid, will aid absorption. In dealing with a sprain of the joint of the extremity he applies oakum around the joint and puts the joint at rest by well-padded splints, thus securing rest and compression. He renews bandage twice a day if necessary, and allays pain and spasm in the beginning by the use of Dover's powder or morphin. If there is much swelling, he applies an elastic bandage over the oakum. As to the time the joint should be kept at rest, he has no special limit, but decides each case upon its necessities. If the joint remain too long unused, there is the possibility of its becoming ankylosed. If the joint be used too soon, there may be acute synovitis excited, which might destroy the joint. In these injuries he makes gentle yet firm passive motion in the direction of flexion and extension, usually on the third or fourth day, but avoids lateral movements in the ankle and knee-joint. If a chronic sprain comes to him, he gives the patient ether, breaks up the adhesions by forcible manipulations, and treats the case as a recent injury. In these chronic cases massage is invaluable. In a sprain of the knee-joint, if the effusion is not absorbed in a week or ten days, he aspirates and then makes firm compression. When the ligamentum patella is ruptured he treats the case with an apparatus, as in fracture of the patella.

Graham [1] strongly advocates the use of **massage in sprains,** bruises, and dislocations. The rubbing should begin in the healthy tissues and gradually enter into the injured area. The manipulator first gently strokes and then kneads, and after doing this for 15 or 20 minutes it will be found possible to use firm pressure in rubbing over the parts which were recently most tender. After rubbing a bandage is applied and these manipulations are repeated twice a day.

Freeman [2] reports a case of **spontaneous dislocation of the hip-joint in connection with typhoid fever.** He sets forth the following condition under which this may arise, reviews the literature of the subject, and tells us that the history of a typical case would be somewhat as follows: The child passes through a severe fever accompanied by swelling of the hip-joint. While still in bed or later on it is noticed that one of the patient's legs is shorter than the other, usually from ½ to 2 in., and this is especially noticeable after the leg is flexed at the hip. The leg is held in a position of marked abduction and inversion, although, as Keen mentions, owing to the extreme relaxation of the parts about the joint, the limb may rarely assume other positions. In Freeman's case paralysis of both limbs occurred in the 4th week of the fever. This paralysis lasted 1, 2, or 3 days. At the end of the 4th and at the beginning of the 5th week pain and swelling occurred in

[1] Edinb. Med. Jour., Aug., 1895. [2] Med. News, Oct. 26, 1895

the right hip, followed shortly by similar symptoms in the left hip. The child left its bed between 6 and 7 weeks, and then it was noticed that there was decided trouble with the left hip. The case resembled the third stage of coxalgia. He made an attempt to reduce this dislocation under ether. Reduction was accomplished, and as soon as the bone was replaced all the motions of the joint returned to normal. At the end of 10 weeks the child was able to walk fairly well, and at the end of 5 months the limb had markedly decreased, although stiffness of the joint was still present. Dislocation was, as is usual in these cases, on the dorsum of the ilium.

Roberts[1] reports a case of **congenital dislocation of the head of the humerus.** He considers the condition to be a malformation like to that which exists in the congenital dislocation of the hip. Reduction was out of the question by ordinary methods, and he has devised an operation which up to this time has been refused.

Phelps[2] reported a case of congenital subspinous dislocation of the head of the humerus. Phelps's opinion was that these cases should be treated by incision, and either putting the head of the bone back or performing resection to make the head fit in the old glenoid cavity. Phelps discovered in doing the operation that even extensive paring of the head of the bone did not permit of its restoration. He decided that the pectoralis major, teres major, and latissimus dorsi muscles had become agglutinated around the head of the bone. He feared to detach these muscles because of the likelihood of impairing the future usefulness of the arm. He therefore pared down the head of the bone until it was the size of the old glenoid cavity, and was then enabled to easily replace it in the socket by paring down the excessive amount of capsule and stitching it up behind the head of the bone.

Congenital dislocation of the hip was discussed at the Congress of Gynecology and Obstetrics in the fall of 1895.[3] Lannelongue presented records of 3 postmortem observations. In the first case it was found that the head of the femur had never departed from the acetabulum, but there was a malformation consisting in an enormous disproportion between the head of the femur and the cotyloid cavity; that is, the cavity had atrophied to a great extent, the atrophy forcing the caput femoris outside of the joint. In the second case the head of the femur was situated amongst the soft parts, not touching the iliac bone, while the fibrocartilaginous cotyloid ligament had been separated by the displacement of the head and remained as a collar around it. In the third case the acetabulum was found very much atrophied, whilst the head of the femur was its normal size. Lannelongue considers that this affection is caused by atrophy of the muscles of the thigh and acetabulum on the same side, and he thinks the original cause was in the nerve-centers of the spinal cord, the first lesion very probably being hydrops articuli.

Broca discussed the subject, and took issue with Verneuil that this form of dislocation is paralytic. The fact that the head of the bone is larger than the

[1] Ann. of Surg., Dec., 1895.

[2] Am. Med. Surg. Bull., Nov., 1895.

[3] Practitioner, Dec., 1895.

cavity shows, however, how useless are attempts to reduce the deformity by manipulating or to treat it by external maneuvers, extension or counter-extension. Broca thinks that there is no resource except operative treatment. He performed Hoffa's operation 28 times upon 25 patients. Hoffa's operation, it will be remembered, consists in gouging out a very large cavity from the ilium into which the head of the femur can be inserted. If the head of the femur is found too far away to be inserted, the only resource is resection of the hip. Calot remarked that the report of cases reduced without operation were almost invariably errors of diagnosis, although 4 well-established cases were undoubtedly upon record. Reduction of the head of the bone without operation is in almost all instances impossible.

Bennet[1] contributes a most useful paper upon **injuries of the thumb.** He discusses elaborately the dislocations of the metacarpo-phalangeal joint, and studies out elaborately a series of experiments. The paper will be of great value for reference.

Morton reports a case of that rare accident **dislocation of the carpus backward** in a boy of 16. He had fallen between two rails with his left arm backward and the hand pronated under him; the thumb hit the ground. In this case the symptoms were characteristic: the radial and ulnar processes were in the normal place and the carpus projected upward and backward. Reduction was easily effected by fixing the forearm, grasping the hand, and making forcible extension. A slight grating was felt. There was no radial fracture. Probably in this case when the fall came the principal weight was borne by the thumb-side of the hand, and thus the carpus was dragged backward.

McBurney[2] reports a case of **reduction of the humerus** complicated by fracture at the anatomical neck. He used the appliances which he devised, a description of which is given in the *Year-Book* for 1896. In his previous paper he had applied his method to the reduction of dislocations complicated by fracture, in which fracture took place at the surgical neck, and he had been apprehensive that in dealing with the anatomical neck it would be necessary to make a very large exposure of the joint, and that the hooks when inserted into the drill-holes in the small fragment of bone would be apt to tear away the cancellous structure; but in this case he effected reduction most satisfactorily.

Judd[3] reports a case of **luxation erecta** of the shoulder-joint. The patient, a man of 32 years, had fallen upon the floor, and as he fell grasped the edge of his desk; thus the arm was abducted, rotated inward, forward, and carried slightly backward. When the patient was first seen his left arm was upright, and the forearm was pronated and resting across the back of the head just below the occiput. The head of the humerus lay in the axilla just below the glenoid fossa. Reduction was easily effected under ether by traction upward and with manipulations over the head of the bone. Only 9 cases of

[1] Dublin Jour. Med. Sci., Dec. 2, 1895. [2] Ann. of Surg., May, 1896.
[3] N. Y. Med. Jour., Oct. 19, 1895.

this variety of dislocation are spoken of by Stimson in his treatise on dislocations.

Ward [1] presents an easy method for securing **reduction of dislocation of the humerus** in any variety of that dislocation. The patient is laid upon the floor; the arm is carried up by the side of the head; the surgeon holds the scapula down with one hand and presses the humerus into place with the other hand. After carrying the arm up by the side of the head, it may be well to give the hand to an assistant, while the surgeon has both hands free to pull down the scapula and to push up the head of the bone. Chloroform is never needed. [To fix the scapula and pull the arm above the head and make traction with the foot seem to be entirely similar in principle to Ward's plan. This method was used by Sir Astley Cooper, and was a favorite plan with the late Prof. Joseph Pancoast.]

Robinson [2] reports 3 cases of **acquired subluxation of the knee-joint** in young children. All the cases were in young females close on 12 months old, who had all been previously healthy and just getting on their feet; all suddenly, from some altered condition of health, perhaps associated with teething, got flaccidity of the muscles of the lower extremities and probably laxity of the ligaments, and with the advent of this loss of support the altered movements in the knee-joints were noticed. Rickets did not exist in either case, neither did infantile paralysis. The cases recovered with the use of simple internal remedies to restore the health and rubbing of the muscles of the leg to increase their bulk and tone.

Flower [3] reports a case of **dislocation of the femur upon the pubes,** and removal of the head of the bone by operation. The man labored under locomotor ataxia, and the head of the bone was broken from efforts at reduction. The head of the bone was removed through an incision, and 15 months after the operation the patient walked very well. [The most notable and original contribution upon the subject of dislocations is the Gross prize essay for 1895 by Dr. Oscar H. Allis. We are unable to abridge it, but strongly commend it to the reader's attention. It is a careful study founded upon elaborate experiment. It revolutionizes our views of dislocations. It is surgical philosophy, and will take rank with the studies of Malgaigne, Astley Cooper, and Bigelow. All surgeons should read it.]

Neuber of Kiel in treating **joint-tuberculosis and bone-tuberculosis** [4] makes an incision, removes all fragments and tubercular foci, fills the cavity with an emulsion of iodoform and glycerol of the strength of 10%, and sews up with buried sutures without drainage. [Several times recently we have tried this plan with success. In each case the joint was for a time stiff after operation, but became mobile under the influence of massage.]

Stoker [5] gives his experience of **excision of the knee-joint for tubercular disease.** He is an advocate for the operation of early excision in

[1] Med. Rec., Jan. 11, 1896.
[2] Brit. Med. Jour., July 27, 1895.
[3] Ibid., Nov. 2, 1895.
[4] Arch. f. kiln. Chir., Bd. xlix. Heft i., 1895.
[5] Practitioner, Feb., 1896.

tubercular arthritis. He does not intend to disparage other measures, such as tunnelling of the bones in the neighborhood of the joint or erasion of the interior of the joint, although the value of the latter procedure is questionable. Observation leads him to place a diminishing value upon erasion of the knee-joint.

He gives some statistical details of the last 30 consecutive cases in which he had operated. He secured 27 useful limbs, and all of these patients are well and active; 2 cases required subsequent amputation, but made good recoveries. There was only 1 death in the series, a boy who died of phthisis within 4 months of operation. The period of hospital detention subsequent to operation varied from 5 weeks to 8 months, the average being 4 months. There were only 2 cases in which suppuration did not occur. In the last 24 cases silver dowels were used to fasten the tibia to the femur. The surgeon should not be discouraged in these cases because sinuses remain for 1 or 2 years. They usually close before that date, but even after this they may frequently be cured, and erasion of sinuses is seldom necessary.

Stokes[1] has lately tried **Bier's treatment** in joint-tuberculosis. He is disposed to doubt its general value in the knee-joint. In 2 cases in which he excised the knee this method has been tried, but abandoned, and an operation made evident that the tubercular disease in the soft parts about the knee was in process of cure, but that the interior of the epiphyses show no reparative tendency. Some surgeons have asserted that the removal of the epiphyses of the femur or the tibia in early life is so grave a matter that excision is forbidden in those cases in which the extent of the disease renders it necessary to go beyond the developmental cartilage, because such a great degree of shortening will follow as to render the limb almost useless. His experience contradicts this statement. Nature seems in instances where the knee-epiphyses have suffered to provide compensatory growth in other parts of the engaged bones. But little shortening follows excision of the knee even at tender years.

Smith and Sturge[2] contribute a valuable article upon the **suppurative joint-lesions of scarlet fever.** They report carefully 9 cases, and then discuss the joints affected, the condition of the joints at the time of onset, the association of nephritis, the heart-conditions, the mode of onset, the source of infection, the treatment, and the results. They advise early and prompt incision and drainage, and besides this they lay stress on the advantage of prolonged immersion of the joint in a warm boric-acid bath. During the intervals between the baths hot boric fomentations are preferable to dry dressings. Nasal feeding is in some cases essential in order to combat the exhaustion of the patient, and may often be used as an easy way of giving extra food in cases when the patient is exhausted with the effort of taking nourishment by the mouth. Ankylosis need not necessarily occur even when suppuration has been profuse. In order to prevent this ankylosis, early passive movement should be adopted soon after the joint is opened, the arm being put

[1] Practitioner, Feb., 1896.

[2] Lancet, Nov. 16, 1895.

in a different position each time it is dressed. The article will well repay perusal.

Gamgee[1] calls attention to the fact that **synovitis** or **suppurative arthritis** may occur as a complication of **erysipelas.** In 817 cases of erysipelas one or the other of these conditions took place. The complication may arise at any time during the attack. The suppurative form requires the promptest and most heroic treatment. Disorganization of the joint will follow, or even the death of the patient, otherwise. The prognosis will depend on the same factors as in other cases of suppurative arthritis. The treatment is perfect rest of the joint; if suppuration exists, we make free incision after drainage, and then immobilize the parts. In some cases amputation will be found necessary.

Roux[2] discusses the subject of **chronic traumatic inflammation of the semilunar cartilages.** Its causes are most commonly squeezing, occasionally twists, and very rarely blows. This squeezing of the cartilage may take place when the knee is hyperextended, when the body is rotated with the leg extended and the point of the foot, which is the pivot, is suddenly arrested. It may occur when the person is in a crouching position and begins to make the movement of extension. It may also occur when the knee is rotated suddenly inward. In 90% of cases the internal cartilage is affected. Subsequently the cartilage becomes thickened from inflammation and the capsule of the joint subsequently involved. The thickening and painful mass can be found between the internal lateral ligament and the edge of the tendon of the patella. Roux says that rest will not cure the case. He advises the use of massage over the cartilage itself and over the quadriceps muscles.

Richardson[3] commends the value of the **diagnostic auscultation of joints.** The double stethoscope is the best instrument to employ, the mouthpiece being covered with rubber to avoid friction. In the healthy joint of a young person we will find no sign on movement, and even after the two ends of bone are brought against each other with force there will only be a very soft percussion sound as if two cushions were striking together. A very slight trouble in the joint gives origin to distinct sounds. He describes 5 joint-sounds—simple dry friction, dry grating, coarse grating, moist crepitant, and coarse crepitant. [We have always been troubled in our trials of this method by the scraping sounds caused by the contact of the instrument and the moving part. The rubber tip suggested by Richards may obviate this trouble.]

Marsh[4] discusses the pathology and clinical history of **joint-ankylosis.** He tells us that it used to be taught that the only manner in which a joint could recover after it had been involved in suppuration was by the development of bony ankylosis; that there was only one cause for bony ankylosis—namely, suppuration. We now know that neither of these propositions is correct. Suppuration is not necessarily followed by bony ankylosis. This is illustrated in pyemia, gout, suppurative arthritis following wounds, acute

[1] Birmingh. Med. Rev., 1895, vol. xxxviii. No. 205.
[2] Gaz. des Hôp., No. 125, 1895.
[3] Asclepiad, vol. xi. No. 43, p. 270.
[4] Brit. Med. Jour., Nov. 2, 1895.

arthritis in infants, and in other cases. In all these, if the joint concerned is freely opened, irrigated, and drained, free movement may be preserved. In some instances the mere aspiration of the pyemic joint may be followed by complete repair. Generally, however, in acute suppuration of the joint, unless there is free drainage, ankylosis will take place, but this ankylosis is rarely fibrous. There is no question that acute bony ankylosis is found following acute suppuration. In chronic suppurative conditions not only is bony ankylosis not the rule, it is the exception. Thus should ankylosis follow tuberculous disease of the hip or the knee, it is rarely bony and is commonly fibrous. Bony ankylosis often occurs in joints quite independent of suppuration, and it is this part of the subject that Marsh invites attention to—bony ankylosis in tuberculosis, in Charcot's disease, in nerve-injury, in gout, in gonorrheal rheumatism, in contusion of joints, in the spine in lateral curvature, and in osteoarthritis. Marsh says that bony ankylosis is sometimes reparative and is sometimes degenerative. When it occurs in acutely inflamed joints it is reparative. It is also reparative when it occurs in tuberculous disease of the joints or spine. In other cases bony ankylosis is a part of wide degenerative changes in the structure involved. It is degenerative in gout; it is degenerative in Charcot's disease. It must be termed degenerative also when it replaces the normal structures by a tissue which is inappropriate for the discharge of the functions of the part; for example, in ossification of the ligaments of the spine and of the joints and ligaments of the ribs. He enumerates 4 propositions: 1. Whenever this condition seems likely to occur the joint should be kept in a useful position; 2. We know of no means by which threatened bony ankylosis can be averted; 3. The use of passive movements cannot prevent bony ankylosis. Indeed, by maintaining irritation and promoting inflammatory exudation passive motions are likely to produce a directly opposite result; 4. When bony ankylosis has occurred, excision or osteotomy may be freely employed to correct any deformity that has taken place, for by modern methods that are now available these operations are attended with scarcely an appreciable risk.

VENEREAL DISEASES.

Heiman[1] contributes a paper, "A Clinical and Bacteriological Study of **the Gonococcus Neisser** in the Male Urethra and in the Vulvo-vaginal Tract of Children." He states that the most satisfactory medium for cultivating the gonococcus is chest-serum agar. Secretions taken from the normal urethra gave negative results so far as concerned the presence of the organism. Such secretions contained bacilli and various cocci, and even diplococci, but none of these organisms could be decolorized by Gram's test, thus differing from gonococci. In 16 cases of gonorrhea he showed that the urine was acid in 15 of them and was neutral in 1. He found that urine-agar was valuable for cultivation purposes, but not for transplantation. Another satisfactory culture medium is placental blood-serum. The best agent to stain with is a 2%

[1] Jour. Cutan. and Genito-urin. Dis., Sept., 1895.

alcoholic solution of methylene-violet. He examined the vulvo-vaginal tract in 20 normal children, and did not find in a single instance the gonococcus Neisser. The diplococci found in pus-cells which bore some resemblance to gonococci have been called pseudogonococci. Instead of this name, he suggests that they be known as diplococci found in the vulvo-vaginal tract of children. Whether these diplococci are pathognomonic of any infectious process he was unable to say, but he does know that they are constantly found in cases of colpitis and they cannot be decolorized by Gram's method.

Dr. Heiman then reviews the literature of vulvo-vaginitis in children. The causation in these cases is often very obscure, but occasionally a direct history of infection may be obtained. The way to stop the spread of vulvo-vaginitis is isolation. The most common mediums for carrying the poison are towels, clothing, instruments, etc. He divides the disease into two classes: 1. Catarrhal, due to uncleanliness, foreign bodies, or to traumatism or to nongonorrheal infection; 2. Gonorrheal vulvo-vaginitis, due either to a pure or mixed infection. The author then sets forth a number of inoculation experiments, and tells us that the crucial test for the gonococci is either inoculation in the human subject, although for obvious reasons this method has been seldom employed. The conclusions of the author are as follows:

The gonococcus Neisser is never present in the normal urethra.

The diplococcus found in the normal urethra can positively be differentiated from the gonococcus Neisser by Gram's test. The gonococcus which Turro described is not the gonococcus.

The best culture medium is liquid sterile chest-serum.

Gram's stain is the crucial test for the gonococci.

For ordinary staining purposes a 2% alcoholic solution of methyl-violet will answer.

The gonococcus is never found in the normal vulvo-vaginal tract.

The diplococcus found in catarrhal colpitis will not decolorize by Gram's method.

The gonococcus Neisser is found in cases of gonorrheal vulvo-vaginitis.

The inoculation-experiments made tend to confirm his belief in the specific power of the gonococcus.

Robinson[1] has tried **methylene-blue in urethritis,** and has decided that in the first day of the attack methylene-blue may do good by its action on the gonococci, but we run considerable risk of strangury and toxic effect. As soon as the gonococci have entered beneath the epithelial layer of the urethra, methylene-blue can do no good and can do no harm.

Hodara[2] advises the following methods of treating **gleet:** After the acute symptoms have subsided for some 2 or 3 months after the beginning of the disease, begin to dilate the urethra. Always make the distinction between an anterior and posterior urethritis. If an anterior urethritis is associated with a posterior urethritis, then the posterior urethra should be washed out with injec-

[1] N. Y. Med. Jour., Aug. 3, 1895.

[2] Ann. des mal. des organes genito-urin., Aug., 1895.

tions of silver nitrate 1 : 2000 to 1 : 3000. Dilatation is to be alternated with the injections. When we are treating a subacute case and find that 2 or 3 dilatations do not produce marked improvement, we may be sure that the case is going to be protracted. We should suspend dilatation for a month and substitute irrigation with silver nitrate, and then dilatation is recommenced. In chronic urethritis in which there is infiltration if dilatation produces increased discharge, it shows that there will be a rapid cure. Cases which are not cured by the above method must be treated through an endoscope. Catarrhal inflammation of the crypts of Morgagni is treated by electrolysis or the incision of the crypt orifices by small knives. Large spots of induration ought to be scarified.

Pucci[1] strongly advises the external use of **guaiacol in the treatment of orchitis.** He makes an ointment composed of 2 g. of guaiacol and 20 g. of vaselin, and paints this over the scrotum twice a day. Guaiacol produces a sensation of burning for about 10 minutes, but after this passes away the pain of the disease is very quickly modified.

Tuttle[2] has also used guaiacol in the treatment of epididymitis and orchitis, with great satisfaction. He applies it as follows: 10 minims of the drug are dropped into a butter-plate, and then painted along the line of the cord and the upper portion of the scrotum. This is left uncovered for half an hour, the parts being elevated. After this hot applications are applied. Tuttle's own method consists in laying the testicle upon the abdomen, covering it with a layer of flannel wet in hot water, and laying over this an ordinary English ice-bag filled with water as hot as the patient can bear.

Krisowski[3] points out **a sign of congenital syphilis** which has received but little attention. He describes a boy of 17 who came for advice with a sharp, infiltrated ulcer of the face. A number of lines were observed to radiate about the mouth. The upper incisor teeth and the corresponding portion of the jaw were absent and the hard palate showed three large scars. The tonsils, uvula, and pharyngopalatine arch were entirely absent, and the hard palate was united to the posterior pharyngeal wall by fibrous tissue. The epiglottis was swollen and the cartilages of Wrisberg and Santorini were absent. The septum of the nose was perforated. This union of the hard palate with the posterior pharyngeal wall almost never occurs except in hereditary syphilis. These linear radiating scars about the mouth are characteristic not only of congenital syphilis, but also of its early appearance. They enable us to distinguish early from late congenital syphilis, hereditary from the acquired form. [Hutchinson and Fournier have for many years insisted on the diagnostic importance of radiating scars about the mouth. The younger Gross always spoke of them in lecturing upon hereditary syphilis.]

Shillitoe[4] reports 18 cases of **indurated pseudochancres.** This condition is frequently called relapsing, and the term relapsing seems to imply recurrence in the original site. This is the usual course of things. But

[1] Gaz. d. Osped., June 1, 1895.
[2] Jour. Cutan. and Genito-urin. Dis., Oct., 1895.
[3] Berl. klin. Woch., Oct. 14, 1895.
[4] Lancet, May 30, 1896.

Hutchinson has told us that they occur to those who have had syphilis, and usually, too, not invariably upon the site of the former chancre. The example which Shillitoe quotes bears out Mr. Hutchinson's statements. Those cases in which secondary symptoms occurred after the appearance of the pseudochancre were all cases in which the pseudochancre appeared early in the disease—that is to say, within a few months of the primary infection—thus leading one to suppose that the presence of a pseudochancre influenced in no way the occurrence of secondary symptoms. Bumstead calls these lesions "recurrent indurations." To have called these new sores pseudochancres simply would seem to imply some relation to the soft or noncardinal symptom, induration; so he adopts the name indurated pseudochancres. He then gives the very interesting histories of 18 cases and discusses them in detail. He thinks that these lesions may possibly be considered as analogous to the relapsing inflammations of Paget. The author's observations show that the indurated chancre may appear at any interval after the initial lesion; that if the interval of immunity has been a long one, the indurated pseudochancre is not followed by secondary symptoms; that if the interval between the appearance of the pseudochancre and the original sore is a short one, the onset of secondary symptoms is not influenced in any way by the new sore; that these lesions may arise spontaneously quite apart from fresh intercourse; that if the history be not known, it is almost impossible to diagnose the pseudochancre from the initial lesion of syphilis; that the predominant secondary symptoms in the original syphilitic attack in the cases he has quoted were some affection of the mouth and throat rather than cutaneous eruptions; that the presence of induration in a sore, accompanied it may be by induration of the neighboring lymphatic glands, does not necessarily imply that the individual has been reinfected with syphilis; that these lesions yield rapidly to mercurial treatment or even spontaneously disappear; that these pseudochancres are not syphilitic, though occurring in individuls who are or have been the subjects of syphilis; that these lesions may eventually terminate in malignant disease. As Hutchinson has pointed out, "the knowledge of the facts as to recurring chancres is of very great importance, since without it very serious mistakes may occur, not only as regards treatment, but in reference to social and medico-legal questions."

Robinson[1] discusses **syphilitic joint-diseases in children.** He tells us that the effect of syphilis upon the joint-structures has received but scanty notice from writers on surgery. He has no doubt many cases which are now considered tuberculous and anomalous forms of rheumatoid arthritis are in reality syphilitic. In 1892, Hutchinson, Jr., delivered a very interesting address on this subject, and pointed out the different pathologic headings under which such cases should be grouped. With very trifling exceptions the same pathologic grouping holds good whether the cases are due to acquired or congenital syphilis. In this paper the writer refers only to the lesions met with in children. Congenital syphilis has one or two forms that belong to it alone.

[1] Brit. Med. Jour., May 16, 1896.

In older children it may be due to either the hereditary or acquired disease. In an experience of some years among children at the East London Hospital the writer has been struck with the frequency of acquired disease among them. Most of the cases were due to heredity. He advises the following classification of joint-diseases in children: 1. Epiphysitis of infants; 2. Symmetrical effusions, usually from 8 to 15 years of age. The two above forms are invariably congenital; 3. Osteitis (*a*) with simple effusion; (*b*) with gummatous infiltration of the synovial membrane and effusion; 4. Primary gummatous synovitis. These forms are met whether the disease be inherited or acquired.

DISEASES OF THE NERVOUS SYSTEM.

The **treatment of spina bifida** is the title of an article by Mayo Robson.[1] His operation consists in excision of the whole or part of the sac. He divides cases of spina bifida into 3 classes: 1. When the sac is so small that the case does not demand operation; 2. When operation is contraindicated by the fact that a very large part of the spinal column is fissured, or where the case is complicated by the existence of hydrocephalus or paraplegia; 3. In which the operation is indicated. He thinks the operation is indicated in meningocele whether the opening be large or small, in cases in which there are very thin coverings to the sac, in cases in which the cord is extended or nerves are spread out upon the sac-wall. [In some rare instances spontaneous cure follows rupture of the sac, but this accident usually causes death by giving ingress to organisms which cause septic meningitis. The same may be said of puncture performed without aseptic care. Until comparatively recently the favorite treatment was the plan devised by Morton of Glasgow—that was tapping, removing half of the fluid and injecting ʒj–ʒij of Morton's fluid (gr. x of iodine and gr. xxx of iodide of potassium in ʒj of glycerin), and painting over the puncture-hole with collodion. This method cured some cases, but it caused many sudden deaths. The modern operation of excision is a vastly better procedure, especially if associated with a closure of the bony cleft.]

Park[2] reports an interesting case of spina bifida in which he operated, closing the spinal gap by a celluloid plate. He excised the sac and pushed the ligated stump back into the canal. Into the opening in the spinal canal he fitted a thin piece of sterilized celluloid, so cut that he could spring its edges in under the bony margin. This case made a complete recovery. He tells us that this mode of operation is only applicable to those cases in which there is a relatively small bony defect. Robson has succeeded in a number of cases by transplanting periosteum into the defect, the periosteum being obtained from the bones of a rabbit and other animals. Osteoplastic operations have been performed by other operators, all of which are uncertain in result. Marey[3] published a resume of the various methods of operating upon these cases. For the purpose of closing cranial defects both heteroplastic and autoplastic

[1] Ann. of Surg., xxii. No. 1, 1896.
[2] Buffalo Med. Jour., Aug., 1895.
[3] Ann. of Surg., Mar., 1895.

methods have been described during many years. In 1820, Walther replaced a portion of a resected skull. In 1868, Wolff reimplanted bone in animals. Macewen and Weir then began to sew bone-fragments over the dura. In 1889, Seydel transplanted a portion of the tibia and the skull, and Poncet successfully implanted a portion of bone removed from the skull of a new-born infant dead of asphyxia. Hinterstoisser began to use celluloid plates, and Gerstein has successfully used rabbit-bone and ivory, aluminum, and other materials. Beach inserted gold between the pia and the dura to prevent adhesions at this point. A thicker specimen of the same metal might easily be used for the purpose of reinforcing or affording strength. The most serviceable material probably will be found in the future to be celluloid.

Wharton,[1] in reporting a case of **dislocation of the ulnar nerve at the elbow,** adds the report of 13 additional cases which he has found in literature. He tells us that this injury is extremely rare unassociated with fracture or dislocation, but that it may result from direct violence or from muscular effort or from violent flexion of the forearm, thus causing laceration of the fascia which holds the nerve in its groove. The symptoms of this injury are pain, tingling in the ulnar trajectory, and a certain amount of disability of the elbow, but the symptoms usually abate with considerable rapidity, and permanent disability rarely ensues. In some few instances neuritis develops, and in view of this possibility it is wise to replace the nerve by operation. Fixation of the elbow by plaster of Paris, the forearm being extended, will keep the nerve in place. This apparatus can only be employed for a limited time. The use of a splint to fix the arm at the elbow and a compress over the nerve have not been satisfactory, as the dislocation has generally returned after the removal of the dressings. The best method of treatment is that devised by MacCormick, who exposed the ulnar nerve, and, having made a bed for it by dividing the fibrous tissues behind the inner condyle, fixed it in its normal place by kangaroo-tendon loops passed through the inner margin of the triceps and loosely around the nerve. The divided margin of the fascial expansion of the triceps tendon superficial was sutured to the nerve. In Wharton's case no operation was performed, because the discomfort was slight, and he soon regained the use of the arm.

Wharton Sinkler[2] reports a case of **complete division of the musculospiral nerve,** in which Keen performed a successful suturing operation 3 months after the accident. It was 5 months after the operation before signs of an improvement were manifest, and some time after this function was restored. [This case proves that in many supposed hopeless conditions operation can be done with at least a fair chance of success.]

Park[3] considers the results of **division or resection** in the neck **of the pneumogastric and phrenic nerves.** The old idea of surgery was that such injuries were necessarily fatal. Park shows that in 15 cases in which the pneumogastric was involved in malignant disease or accidental injury 11 died

[1] Am. Jour. Med. Sci., Oct., 1895.

[2] Therap. Gaz., July, 1895.

[3] Ann. of Surg., Aug., 1895.

and 2 recovered, while in 2 instances the result has not been noted. In a total of 50 cases of accidental injury of the pneumogastric nerve we do not know the result in 2 instances, while of the remaining 48, 21 died and 27 recovered. Even in the fatal cases it is impossible to say that in any instance death was due to injury of the nerve, and some of the deaths occurred at such an early period that a nerve cause is extremely doubtful. The weight of the evidence is in favor of the comparative safety of attacking this nerve when involved in disease, and when too much other operating is not necessitated by the condition which caused the operative attack.

Guinard[1] is inclined to advocate the **resection of Meckel's ganglion for neuralgia,** instead of the removal of the Gasserian ganglion. Three cases of the former operation had been free from pain for over 2 years. Chalot considers the removal of the Gasserian ganglion a very dangerous procedure.

Krönlein[2] has operated for neuralgia twice by what he designates **the retrobuccal method** of exposing the third branch of the trigeminus. The operation is a safe one. It is easily performed, and it does not interfere with the functions of the part, but a fine scar is left on the cheek, and neither the masticatory muscles, Steno's duct, nor the facial nerve need be injured. In the second case he operated on he removed the superior maxillary nerve, even its intracranial portion, through the Gasserian ganglion, and even a portion of the ganglion. Both of these operations led him to think it possible to remove the fifth nerve from its intracranial course by an entirely extracranial operation.

Krause[3] has during the past 3 years advised the **removal of the Gasserian ganglion** and its posterior root by intracranial operation for the cure of severe neuralgia. Resection of one branch or of more than one branch of the fifth nerve produces no certain result, and we know that in facial neuralgia the Gasserian ganglion has undergone pronounced change. Krause makes an osteoplastic flap, the base of this flap being just above the zygoma, and he cuts the bone with a circular saw which is run by electricity or by an ordinary dental engine. The dura mater is carefully detached from the bone of the middle cranial fossa, and elevated, together with the brain, by a broad retractor. The middle meningeal artery is now tied and divided near the foramen spinosum. The inferior maxillary and the superior maxillary branches are found, exposed, and cut through at the foramen rotundum and foramen ovale, the ganglion and its posterior root after being isolated are twisted out. In 3 cases Krause was able to extract the posterior root as far as the pons Varolii. The first branch is attached to the wall of the cavernous sinus. We make no attempt to expose it with a knife and tear it across when we remove it. The flap of skin, muscle, and bone is replaced.

Krause says that the average period of the after-treatment is 2 weeks. He prefers this operation to Rose's because the latter does not satisfactorily expose the ganglion, and in consequence we cannot be sure that the ganglion has been entirely removed. Rose's operation, too, opens us to the danger of injuring the

[1] Gaz. des Hôp., 1895, p. 1251. [2] Beit. zur klin. Chir., xiv. No. 3, p. 725.
[3] Centralbl. f. Chir., 27, 1895.

Eustachian tube and setting up a septic meningitis. The greatest danger of the operation is hemorrhage, because we may cut the meningeal artery before we have tied it or we may injure the cavernous sinus. In some cases because of the degree of hemorrhage it has been necessary to perform the operation in two stages. The pressure made upon the brain by lifting it with the retractor does not seem to produce any bad effect. Of 51 of these operations upon record, 5 were fatal; not a single case of relapse has yet been announced. Krause has never seen any serious injury of the eye follow the operation, although there is always anesthesia of the cornea and the conjunctiva. Keen[1] has reviewed this subject and reported **5 additional cases.** He then announced and still maintains the belief that the Hartley-Krause method is much superior to Rose's operation, because the mortality is less, because access is had to the ganglion through a large opening, and because we are enabled to remove the entire ganglion with its roots. An osteoplastic flap should be cut with chisels or a circular saw. There will always be hemorrhage on trimming down the bone, the source of the hemorrhage being the anterior branches of the middle meningeal and occasionally the main trunk. In 3 of Keen's cases the posterior branch of the middle meningeal was also injured. In 3 cases the main trunk was torn. Bleeding from the branches can be controlled by encircling the artery with a fine silk thread and tying, the thread being passed under the artery by means of a curved Hagedorn needle. In bleeding from the main trunk plug the foramen spinosum with a curved blunt instrument (Allis's dissector), substitute the left fore finger for the dissector, and then pack under the finger with iodoform-gauze. The gauze is left in place for 3 days. Fowler's advice to ligate the external carotid as a preliminary procedure is bad advice, as such an operation is unnecessary.

The temporosphenoidal lobe is lifted from the middle fossa by the fore finger, and is held up by a broad spatula. When the bleeding from the middle fossa is very severe it may be advisable to do the operation in stages, packing with gauze to control bleeding, and 3 days later opening the wound, removing the gauze, and completing the operation. It is of course much better to do the operation in one stage if possible, as the danger of infection is vastly greater in a second operation than in the first. After isolating the ganglion and its 2d and 3d divisions from the dura above and the dura beneath, seize the ganglion with a pair of hemostatic forceps, cut the 2d and 3d divisions at their foramina, rotate the forceps, and thus avulse the ganglion and its roots. The first division must not be meddled with, because it penetrates the cavernous sinus, but the ganglion is torn off from this division. In Keen's first 4 cases the lids were not stitched together, and yet no trouble arose in the cornea. In the fifth case the eyeball was protected for 4 days by occlusive dressing, but nevertheless a corneal ulcer formed shortly after the operation. Keen suspected that the lids were open under the dressing, and that the anesthetic cornea was abraded without the patient's knowledge. In the sixth case the lids were stitched. After 4 days the stitches were cut, and the cornea was found in good

[1] Am. Jour. Med. Sci., Jan., 1896.

condition, but 24 hours later a corneal ulcer began to form. Dr. de Schweinitz freshened the middle of the lid edges and stitched them, thus occluding the middle of the palpebral slit, but leaving the ends open for the drainage of secretions.

Experiments on animals would indicate that the corneal trouble is not caused by microorganisms, but is caused by drying of the cornea and unnoticed injury of this anesthetic region, the remedy being a moist atmosphere (V. Hippel). Keen decided in future to close the lids after these operations, either by sutures or by adhesive plaster.

It is not absolutely certain that breaking up of the ganglion is insufficient for cure. The entire removal of the ganglion is not more dangerous to life, but is more dangerous to the eye. If time shows that breaking up the ganglion gives a permanent cure, that is the operation to be preferred. In the light of several reports of relapses after breaking up of the ganglion, it seems likely that removal of the ganglion is necessary. The mortality by Rose's method is 18%, by the Hartley-Krause method, 9.8%.

[Doyen of Rheims makes a sickle-shaped incision in the temporal region. The handle of the sickle is vertical, is between the external angular process and the auditory meatus, and passes not more than 15 mm. below the zygomatic arch. He then resects the zygomatic arch, sections the coronoid process of the lower jaw, and clears the temporal fossa. He finds the lingual and inferior dental nerves, clamps them, cuts them, and ligates the internal maxillary artery. He traces up the inferior maxillary nerve to its point of emergence from the foramen ovale. He then trephines the skull on the temporosphenoidal suture, and makes clear a large space by the surgeon. The base of the greater wing of the sphenoid is removed up to the oval foramen. By drawing upon the dental and lingual nerves the inferior maxillary nerve is brought clearly into view, and by traction upon the inferior maxillary nerve the ganglion and its branches are brought within easy reach. The superior maxillary division is cut at the foramen rotundum, and the ophthalmic division is cut at the sphenoidal fissure.[1]]

Mayo Robson[2] advocates the **treatment of meningocele** by a plastic operation. There is only one difficulty in operating upon a cranial meningocele, and that is that portions of the nerve centers may be contained in the sac; but this may usually be diagnosed by careful palpation with or without a preliminary aspiration of the sac. Even when uncertain, we are not prevented from doing an exploratory operation, for we can make an incision near the base of the tumor just large enough to admit the finger, and if it is deemed unwise to proceed, this incision can be readily closed. In simple meningocele there is usually a distinct neck to the sac, which neck should be ligatured off. The skin-flaps are then sutured separately, and the ligatured neck of the sac lies outside of the line of the superficial sutures.

Plummer[3] presents an elaborate research upon the surgical anatomy of the

[1] See Arch. provin. de Chir., vol. iv. No. 7, July, 1895; or the most excellent resume by H. P. De Forest in the Ann. of Surg. for Jan., 1896.

[2] Am. Jour. Med. Sci., Sept., 1895.

[3] Ann. of Surg., May, 1896.

middle meningeal artery. He shows that this artery is subject to wide variations in course and distribution. After it leaves the foramen spinosum there is no location at which the main trunk or one of its terminal branches has a definite position and a constant position, except where the anterior branch crosses the sphenoparietal suture on to the anterior inferior angle of the parietal bone. A trephine opening 1 in. in diameter immediately back of any portion of the coronal suture will almost invariably reach the anterior branch or a branch from it. In the very great majority of instances also the trunk of the vessel is within the cranium. In some instances the anterior branch is derived from the orbital branch of the lachrymal branch of the ophthalmic. The chief supply of the parietal bone is from the posterior branch rather than from the anterior. The blood-supply of the dura mater traverses as many and as pronounced curves as that of the pia mater. In most cases the blood-supply of the skull is symmetrically arranged, but there are many exceptions to the rule. In the majority of cases the anterior branch is enclosed in a canal at the anterior inferior angle of the parietal bone. In locating the anterior branch the most advantageous site is that which reaches it high enough to prevent it escaping in case it originates from the orbital branch, and to expose or lie above the orbital branch when it exists merely as a communicating branch, and which involves least frequently the bony canal and the ridge along the lower end of the coronal suture.

Krönlein's method is the best on locating the anterior branch. No method will certainly locate the posterior branch. In seeking for the anterior branch we must avoid the region of the lateral sinus. The posterior branch is best located by Steiner's method. The ideal method for exposing the middle meningeal and its branches is by the Hartley-Krause osteoplastic flap. An essential step in the performance of Rose's operation is the shutting off of the circulation of the middle meningeal extracranially.

Cale[1] reports 2 successful operations for **traumatic insanity,** which he considers is rather an infrequent occurrence, but which is occasionally met with. He thinks that chronic meningitis and encephalitis play an important role in the production of insanity, and that this mental condition not unusually follows circumscribed inflammation of the vault of the skull. All injuries of the head work either as sole or contributing causes of insanity, and injury of the bones makes resulting insanity more probable than the injury to the soft parts. The insanity often arises during or shortly after the healing of a wound. Exostosis, tumors, or caries of the skull may be responsible for the condition. He then discusses the symptoms of the disorder and presents 2 cases. [Traumatic insanity is a rare condition. Occasionally an insanity follows an accident because of nervous shock, rather than physical brain injury. The true insanities have no demonstrable lesion, the disorder being in the subtle chemistry of the nerve-cells, and the surgeon's knife cannot correct aberration in tissue chemistry. Many and various lesions have been described, but they are secondary to the insanity, and not causative of it, and to remove a secondary

[1] N. Y. Med. Jour., Oct. 12, 1896.

lesion cannot cure the case. The subject has been obscured by ridiculous statistics, by faulty observations, by reporting cases under such absurd titles as delirium of persecution, and by failing to regard the effect of the operation per se. We are not justified in operating without clear evidence of local lesion. Let those who claim so much for the procedure report an authenticated case of cure of a man with a systematized delusion of persecution, and we will listen with attention. Many of those reported cured never were insane; others are still insane; others had only hysteria or hypochondria or shifting hypochondriacal delusions. A person who claims that by operation he "will empty the asylums," either means to empty them by increasing the death-rate or will not empty them at all. In fact, we would rather fear that the mental attitude of the surgeon indicated a probable though slight increase in the insane-asylum population of the near future.]

Horsley[1] reports 5 cases of **leontiasis ossium,** the term by which is meant the development of a bony new formation resembling an overgrowth of diploe, and attacking the cranial bones and by preference the frontal or more rarely the facial bones, especially the jaw. In 3 of the cases operation was performed and was successful. The operation consisted in removing the mass piecemeal from the border of conjunction with the healthy bone. In each of the 5 cases the growth commenced in childhood or in very early adult life. This condition caused considerable pain, owing to pressure upon the fifth nerve, and neither syphilis nor trauma was the exciting cause. In the portions which were subjected to microscopic examination it was found that there was an outer hard portion of bone which was formed of normal bony trabeculæ which were separated by enormous medullary spaces, these spaces being filled with connective tissue which is almost myxomatous in character. The central soft parts crumble very easily, and it is noticed that the bone trabeculæ are undergoing absorption, and that the medullary tissue is replaced by fibrous tissue.

Kramer[2] makes a contribution to the study of **cerebral concussion,** and he concludes that a blow to the head produces a momentary increase of intracranial tension, and consequently compresses the whole brain. Compression interferes with the blood-supply of the entire brain, and this interference accounts for primary symptoms. Syncopic death is produced by paralysis of the respiratory centers, the cardiac centers remaining intact, and the fatal result may often be prevented by the prompt employment of artificial respiration.

Von Bergmann[3] in an elaborate article upon **Advances in Brain-surgery** does not think that operative treatment is of much value in Jacksonian epilepsy. It is quite true that excision of the cortical area may stop attacks for a time, but they will return in the future. Cases of epilepsy due to tumors of the cortex may be cured by operation. He believes in opening the skull by means of a circular saw which is run by electricity, and by closing the resulting brain-defect. The greatest advance that has been made is in the technic of operating for the treatment of intracranial suppuration and for sinus-thrombosis. The operation ought always to be carried out in such a

[1] Practitioner, July, 1895. [2] Ann. of Surg., Feb., 1896. [3] Ibid., Mar., 1896.

manner that the first depot reached will be the site of the earliest mischief, and if we determine whether that condition has gone on to intracranial abscess, then the operation can from here be pursued in the regular course. In other words, the operation ought first to expose the roof of the cavity of the tympanum. Very great advances have been made in the treatment of infected sinus-thrombosis. Jansen has reported 20 cases successfully operated upon in the University of Berlin. In 14 of these cases there was a large abscess around the sinus, and in 11 of these there were extradural abscesses of the middle fossa. In 13 of Jansen's cases 6 were cured; in 17 of Macewen's cases 13 were cured; and in 13 of other operations 8 were cured.

Ashhurst[1] remarks upon **trephining of the cranium,** reporting 24 primary operations for compound fractures, with 11 recoveries; 2 were operations during the intermediate period, both successful; 3 were secondary operations, and 1 recovered, and 2 deaths, both in cases of abscess. He does not think that there is as much urgency in operating upon compound fractures of the skull as there is in the case of compound fractures in the extremities. In the latter the operation should be done as soon as the patient is able to bear it, but in compound fracture of the skull we find a larger number of recoveries in delayed operation than when the operation has been done immediately. Of course in bad cases, when the operation is evidently necessary, he does not advise delay. He has operated in 3 cases for syphilitic disease, with 2 deaths. He has been induced to trephine in 3 cases of epilepsy; all recovered from the operation; 1 was much benefited as long as he remained under observation; in the other 2 there was no evident improvement. In melancholia following an old fracture of the skull he trephined, but obtained no relief. He operated in 2 cases for convulsions which followed old injury; 1 died, and in the other there was no permanent gain. He has operated unsuccessfully upon 3 patients for cerebral complications resulting from middle-ear disease. Although he operated in 21 fatal cases, in only 1 case did the operation seem to be responsible for the patient's death. In regard to the locality of the injury, he finds that fractures involving the frontal bone, omitting those simply involving the frontal sinuses, there were 5, with 4 recoveries and 1 death. These figures do not confirm the general impression that there is special danger in fractures of the frontal bone. In cases of impacted fracture he does not believe in interfering in the absence of symptoms. In regard to watery discharge from the ear he has observed that so long as the discharge continues the patient may do well, but if it suddenly stops the patient will probably become comatose and die in a few hours. He has never seen a fracture of the base of the skull in which he thought trephining indicated. He thinks that an attempt should be made to prevent infection by cleansing the ears and, as far as possible, the nasal and buccal cavities. After securing cleanliness we will obtain recovery in a considerable number of cases, relying upon the use of Dover's powder, with hygienic treatment, rest in bed, cold to the head, laxative enemata, etc.

Bromet and Pardoe[2] record an extremely interesting case of **fracture of**

[1] Internat. Med. Mag., July, 1895.

[2] Lancet, Sept. 21, 1895.

the skull in which no history of injury could be obtained—in fact, with a history that on the very morning of the seizure he was apparently well, yet he passed into a drowsy and irritable condition, and subsequently into profound coma. He was a police sergeant, and had been seen by many people the night before this condition. He had gone to bed on Saturday morning, and had got out of bed for different purposes on several occasions. Later in the day his symptoms began. On Sunday night he was taken to the hospital. He lay on his side with closed eyes and breathed easily, but resented any attempt at examination, and made incoherent answers when roused by shouting in his ear. The pupils were normal and equal; the pulse was 56, full and strong. There was no paralysis; the lungs and the heart and other organs were apparently healthy. A bruise was noticed upon the left ear and another at the inner canthus of the left eye. The urine showed a specific gravity of 1030; it contained sugar, but no albumin. The next day the patient was quite unconscious, although there was no paresis. A consultation was held to decide whether the symptoms were postepileptic or diabetic, and it was decided to make an exploratory operation. Bidwell operated, and he found an extensive fracture extending from the center of the lambdoidal suture behind to the posterior part of the zygoma in front, traversing the occipital squamous portion of the temporal and parietal bones and also part of the zygoma. The fracture was fissured and splintered. Mr. Bidwell removed the splintered portion of bone, together with some more bone around it, in the neighborhood of the middle meningeal artery, and on opening the dura mater a large amount of lacerated brain-substance and fluid matter escaped. The blood was from one of the posterior branches of the middle meningeal. The wound was closed, and the patient for a short time appeared to improve, but in a few hours paresis set in upon the right side. The urine was now collected, and was found to contain not only sugar, but acetone. He died about 36 hours after admission. Postmortem disclosed most extensive fracture of the skull.

Miles[1] discusses the **diagnostic value of fluid discharges from the ear** and head-injury. He concludes that in most cases in which bleeding and welling of cerebrospinal fluid from the ear are present there is fracture of the middle fossa of the skull, but that these sinuses are not absolutely pathognomonic—that the fracture in many or in most cases is simply a coincidence. The great bulk of the hemorrhage comes from the vessels of the arachnoid and pia mater, and from the arachnopial membrane and the temporosphenoidal lobe of the brain, and not from the fractured bone; that the path of the discharge is along the sheath of the auditory nerve, through the lamina cribrosa to the vestibule, thence through the middle ear and ruptured membrane to the external meatus. Excluding the extraordinary risk of sepsis, the prognosis is better when these discharges exist than when they do not.

Estes[2] reports a case in which he used **gold-foil to plug a cavity** in the cerebrum, and 2 other cases in which he used it to replace destroyed dura mater, and thus retained the obturator function of the lost membrane. He

[1] Edinb. Med. Jour., Nov., 1895.

[2] Jour. Am. Med. Assoc., Apr. 4, 1896.

considers a valuable adjunct to the use of gold-foil inside the cranium is its inhibitory action upon the growth of microorganisms.

Dana[1] discusses the operation of **craniectomy for idiocy,** and he thinks that good results may come from it. In his own practice he has had 12 cases, of which 3 died; in 1 there was doubtful result, and 3 improved. In considering statistics of 22 cases he says that 6 were improved and that 6 died. The type that offers the most hope from an operation is congenital idiocy not due to paralysis or epilepsy, the form of the condition which is most frequently associated with imbeciles. There may be ossifications of the sutures, but he does not think that the idiocy results from this. There may be some benefit due to the division of the skull and the relief of the intracranial pressure, but the chief value is that the operation calls personal attention to the general care, and the attention which is given acts beneficially on the mental condition. The period when operation should be done is before 4 years of age, although alleged cures have been reported up to the age of 9. We should not operate in cases of cretinism or inherited syphilis, and if the child has rickets it ought to be treated carefully before operation. Tubercular children ought not to be touched. Dana thinks we have a right to employ the operation upon carefully selected cases. [The number of cases in which operation should be attempted is very limited. This procedure has been practised so ignorantly and indiscriminately that it has become almost a reproach to surgery. Our views expressed in the *Year-Book* for 1896 remain unaltered.]

Sheild[2] advises us to treat severe **mastoid disease** by the implantation of skin-flaps (Fig. 75). The idea of implanting flaps of skin into the cavities left by the removal of a diseased portion was derived from the expression of Macewen, who spoke of "papering" cavities with skin, and it was partly derived from observing the remarkable manner in which the integument grows downward and fills up carious cavities in the long bones after the removal of sequestrum. In each of these 3 cases of Sheild it will be observed that they were chronic and inveterate disease — that previous operations had been performed which had failed to cure. After the operation now to be described such great improvement took place that it brought them as near to definite cure as could in the nature of things be expected. The operation is performed as follows: A flap of integument is raised from behind the auricle, which flap includes the orifice of any sinus. The flap is left attached by a stalk. The auricle is detached forward, and the soft parts are turned back over the mastoid by hori-

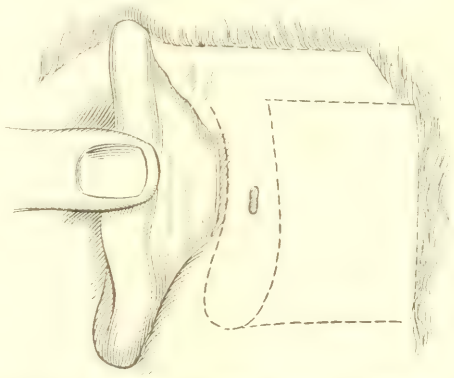


FIG. 75.—Treatment of mastoid disease by implantation of skin-flap (Lancet, Feb. 8, 1896).

[1] Am. Jour. Med. Sci., Jan., 1896.

[2] Lancet, Feb. 8, 1896.

zontal incisions. The lining membrane of the canal is separated from the bone. A ½ in. trephine is applied immediately behind the canal, or, if a sinus exists, this is enlarged with a gouge. The diseased bone is removed and caseous areas are scraped away. The overhanging edges are smoothed down with a chisel, and the posterior bony wall which separates it from the cavity just made is cut away with bone-forceps. Granulations in the tympanum are removed by the curet, and the tympanum and the mastoid are thrown into a common chasm. Chisels and gouges may be used to remove the bone, and a burr may be used instead of the two former. The flap of skin is pressed down into the cavity and is packed superficially with iodoform-gauze. In his first 2 cases he united the margins of the tunnel from the implanted flap, leaving an aperture for the gauze to be withdrawn. In the last case he left the tunnel entirely open, and believes that the latter plan is the best, as the discharge can be easily washed away and there is no chance for its reaccumulation.

Souchon[1] writes an article upon the **exploration of the brain with a needle** and syringe through capillary holes drilled through the skull. He drew the attention of the profession to this in 1889, and proposed this method to take the place of trephining: the simplicity of the procedure and safety recommend it as an easy means within the reach of a greater number than the more serious and complicated operation. He endeavored to determine the danger of operations upon dogs, and decided that it was possible and practicable to explore the brain in this manner. Matas has tried it upon a case, the result of which, however, was negative. He does not think there is the slightest danger of hemorrhage in this procedure. In August, 1893, Schmidt published a case where this process was used with a negative result, but this negative result was valuable in a diagnostic point of view. The idea was originally suggested by Middeldorf in 1856, and was repeated by Maas in 1869. [The procedure is both unsafe and valueless. If it shows nothing, we must trephine to reach a conclusion. If it shows something, we must trephine anyhow. The danger it exposes the patient to is hemorrhage. It should never be used.]

Starr[2] makes a contribution to **brain-surgery** with especial reference to **brain-tumors.** In speaking of cortical epilepsy he says that experience seems to show that, though a cessation of attacks may follow operations, these attacks are almost certain to occur in the future. He is becoming more and more reluctant even in well-defined cortical epilepsy, whether of traumatic or spontaneous origin, to advise operation. In cases in which the brain has been injured and there is an irritation cicatrix, the excision of this cicatrix will be followed by the production of another cicatrix and no permanent cure is effected. Experience of the last 3 years confirms the view he set forth in his book, that only 7% of brain-tumors are operable. The difficulties met with are first the troubles in localizing, and second the difficulty of reaching the tumor even when localized. Many surgeons have directly advocated trephining in every case diagnosed of brain-tumor as important, even when there is no

[1] Jour. Am. Med. Assoc., May 30, 1896.

[2] Med. Rec., Feb. 1, 1896.

possibility of removing the tumor. This operation relieves intracranial pressure, and thus relieves headache and vomiting, vertigo, and optic neuritis. Horsley is a strong believer in this procedure, and he thinks that it even has a beneficial effect upon the growth of the tumor, occasionally producing its absorption. Starr thinks this operation is occasionally justifiable. It is to be remembered also that a marked change in the circulation consequent upon the relief of intracranial pressure may aid the absorption power of some drugs, and it is not to be forgotten that cases of brain-tumor have occurred in which the diagnosis is absolutely certain, but which have recovered under the use of mercurial inunctions with large doses of iodid of potassium.

Starr then records a case that shows even in individuals where there is no history of syphilis medical treatment alone occasionally succeeds. He thinks trephining for the relief of pressure is perfectly justifiable. The essential preliminary to the operation for brain-tumor is accurate localization and a reasonable prospect of reaching it. The nature of the tumor itself is always a matter of uncertainty. In a case of Dr. McBurney's in which every symptom pointed to a small tumor of the leg center of the right hemisphere operation disclosed a most extensive glioma which occupied both central convolutions and extended inward as low as the face centers. It is only when the tumor is small, lies on the cortex, but does not invade it, and can be removed without serious damage, that the prognosis is really good. Starr gives a tabulated statement of the results of operations for brain-tumor, as follows: The total number of cases operated upon for brain-tumor was 162, of which cases 137 were cerebral and 25 cerebellar; in 48 cases the tumor was not found at the time of operation; in 5 cerebral and 2 cerebellar cases the tumor was found at the time of operation, but was not removed; in 72 cases (65 cerebral and 7 cerebellar) the tumor was removed and the patient recovered; and in 35 cases (28 cerebral and 7 cerebellar) the tumor was removed, but the patient died.

Looking over successful cases, it is evident that the most favorable cases for operation are those in which the tumor is in the motor region of the brain, producing first local spasm, then local paralysis, or in the speech-area of the brain, or in the vital area of the brain. In each of these regions localization is easy and the tumor can be readily reached and removed.

Starr then gives a tabulated statement of the variety of tumor removed, and the results, during the 3 years 1893 to 1896, as follows: Sarcoma, 15—10 recoveries, 5 deaths; glioma, 4—3 recoveries, 1 death; gliosarcoma, 2—both recoveries; cystic, 8—3 recoveries, 5 deaths; tubercular, 6—3 recoveries, 3 deaths; gumma, 3—1 recovery, 2 deaths; fibroma, 1—death; angioma, 1—recovery; variety of tumor not stated, 7—3 recoveries, 4 deaths: total number of cases operated upon, 47; recoveries, 26; deaths, 21.

The tumor most frequently removed is sarcoma, with the best prognosis. Cysts are easily removed, but subsequent results are less favorable. It is not sufficient to evacuate a cyst, but its wall must be removed. If we simply evacuate it, it will refill, and when we remove the wall we damage surrounding structures. In order to remove glioma extensive excision of the brain is necessary, and if glioma recurs it can be excised a second or even a third time. Tubercular tumors have been successfully removed from the brain. Krönlein collected 15 of such cases, 5 of which were followed by permanent cure. Von Bergmann objected to this operation because of the liability of recurrence. The question of operating for gumma is an open one. Many of these tumors can be absorbed by the use of antisyphilitic remedies, but very large ones, which do not yield to medicine, we should operate upon.

Starr then records a table of tumors successfully removed during the last 3 years, of tumors trephined for and found, not removed, and of tumors trephined for, but not found. [Year by year the mortality from these operations becomes less. The fact that in 30% of these cases no tumor was found is a reproach to our power of diagnosis.]

DISEASES OF THE SPINAL COLUMN AND SPINAL CORD.

Tubby[1] in a paper on the **treatment of abscess and Pott's disease** maintains that with quiescent areas aspiration is only suited to the small residual abscess which follows a previous operation, with the idea of obtaining primary union. Aspiration can also be applied to deep-seated abscesses which are in immediate contact with serous surfaces or with viscera. Cervical abscess should be opened on the side of the neck. Psoas and lumbar abscess should be treated by the radical plans of Barker and Treves, and this method is most likely to succeed if the bone-disease is stationary or is healing. In children the incision should never be made in or near the groin, and the use of a drainage-tube is dangerous because of the liability to septic infection and the danger of forming a persistent tubercular sinus. The lumbar incision is very valuable in a certain limited number of cases. Many cases of abscess are opened by an incision resembling that of Sir Astley Cooper for ligating the iliac artery. The possibility of removing large bony sequestra by incision down to the vertebral column is very doubtful, and in a great number of cases no such procedure is attempted, because the bone is simply diseased upon its surface. We should always attempt to dissect out the sac, although we will frequently fail in the attempt.

Müller[2] writes upon **Acute Osteomyelitis of the Spine,** a rare disease of which but few cases have been recorded. The author reports a case which was situated in the dorsal region. The pressure-symptoms came on with great suddenness, and Müller inferred that they were due to sudden edema of the cord. There were none of those antecedent symptoms of irritation which are common in tubercular processes.

In an elaborate paper upon acute primary osteomyelitis of the vertebræ

[1] Med. Press, Oct. 30, 1895.

[2] Deutsch. Zeit. f. Chir., xli. No. 6.

Makins and Abbott[1] say that an acute infective osteomyelitis of the bones of the vertebral column is a disease rarely met with, and is often recognized only on the postmortem table. The disease is more common than has been assumed. The paper contains the record of 8 cases with postmortem notes: 2 of these cases have been previously published; 2 have been furnished by recent papers of Hahn and Müller, and 11 others have been found previously recorded. Thus they have collected 21 cases on which to found their opinions. The cases are described in detail. The frequency of the occurrence of this disease is uncertain, and reliable statistics can be obtained only in the future. Hahn, by employing the statistics of previous observers and by adding some additional cases, shows that in 661 cases of infective myelitis the long bones were the seat of disease in 610 instances, the short and flat bones in 51 instances; and among the 51 instances of disease of the short and flat bones there was 1 instance of vertebral disease. There is no fixed period of age. The cases here are between the ages of 23 days and 46 years. Any region of the spinal column may be affected, although the lumbar region seems to be the one most liable to trouble. In every case suppuration occurred, although in a varying extent, and the situation of the abscesses corresponded with the seat of primary disease and the portion of the vertebra affected. In disease of the body of the vertebræ the abscess was anterior, either postpharyngeal, mediastinal, psoas, or pelvic, while in implication of the neural arch the abscess was posterior. The abscess travels in both directions when the transverse process is affected. In 2 cases of this condition slight angular curvature was noted. Implication of the spinal cord and meninges may take place, and it seems likely that in the past osteomyelitis has been overlooked, and has been the real cause of a number of cases of so-called spontaneous acute meningitis or myelitis. In a large percentage of cases nerve-complications are the cause of death. The symptoms and course of acute infective osteomyelitis of the vertebræ differ in no essential particulars from those observed when the same disease attacks the bones of the limbs, but the local signs do present special characteristics and differ according to the segment of the spinal column affected, while the frequent implication of the cord and its coverings gives to the disease its chief interest and importance. The authors consider the special symptoms which belong to the special regions of the back—the symptoms dependent upon implication of the spinal cord, nerves, and meninges, the diagnosis, prognosis, and the treatment. The treatment is the same practically as that applied to the disease in any other region. The special points to be borne in mind are the necessity for rest for the spinal column, to be maintained by attention to the position of the patient, the early recognition and the prompt incision of abscess, and the removal of dead bone. The last point is especially important when the neural arch is affected, and if the disease extends the whole vertical depth of one side of the arch, the bone should always be removed to prevent pus gathering in the canal. The later treatment when the bodies are the seat of disease includes the application of a jacket.

[1] Ann. of Surg., May, 1896.

Faisst[1] writes on **fractures of the cervical vertebræ**—injuries of very great danger, and likely to cause death at once or in the course of a very short time; the higher up the fracture is situated the more dangerous it is. The author reports a case in which the 4th cervical vertebra had been fractured, and in which there was complete paralysis, sensory and motor, of upper and lower extremities, and yet recovery followed.

Horsley[2] has recently reported 7 cases in which **laminectomy** had been performed either for caries or for fracture. None of the patients died. In Case 1 there was complete paralysis of all 4 limbs due to caries of the atlas and the axis. Power reappeared slightly on the 6th day after laminectomy, and progressively increased, and the patient is now entirely well, except some wasting of the interossei. The 2d case was performed for caries of the 5th and 6th cervical vertebræ. The patient made an excellent recovery. Case 3 was caries of the lower cervical vertebræ. The legs were completely paralyzed, and so was the right arm. There was very little power in the left arm. Power began to return the 3d day after operation, but the return was temporary and little real progress was made. Case 4 was a fracture of the cervical vertebræ 8 months previous, and there was paralysis of all the limbs. Analgesia was also present, and this condition points always to an affection of the central gray matter of the cord. Laminectomy was done, the bone of the 5th and 6th cervical vertebræ removed, and a mass of fibrous tissue was dissected from the dura. The patient rapidly improved, and the only remaining defect was wasting of the interossei. Case 5 was a fracture of the 6th cervical vertebra received about a week before. Laminectomy was done upon the 4th, 5th, and 6th cervical vertebræ, and a ridge was removed which had been compressing the spinal cord. On the 12th day power began to return, and the patient completely recovered. Case 6 was a case of fracture of the cervical vertebræ with the gradual onset of paralysis. Laminectomy was done upon the 6th and 7th vertebræ, when a projecting ridge was felt, but on examination this disappeared. The patient is at present making a slow recovery. Case 7 resulted from a blow upon the head in which the patient walked for 200 yards, and then became with great rapidity completely paralyzed. From this condition he recovered with partial spastic paraplegia, with postaxial anesthesia of the upper limbs. Laminectomy was performed, the 6th and 7th cervical vertebræ were removed, and 3 weeks after the operation he began to recover, and made an absolute recovery.

Mr. Horsley tells us that in many cases after injury there is a transitory recovery, which is followed later by a return of the paralysis, this paralysis probably being due to edema of the cord. He thinks that when there is an absolute loss of the deep reflexes and complete vasomotor paralysis we must assume that there has been complete division of the cord. In the ordinary cases treatment by extension is applied for 6 or 8 weeks. In caries of the vertebræ laminectomy is always of service, because by its means we are able to

[1] Beiträge z. klin. Chir., xiv., 1896.

[2] Lancet, Aug. 17, 1895.

remove thick masses which were making pressure upon the dura mater. In some cases operations are done because of impending asphyxia.

Page[1] in a clinical lecture on "Three Cases of **Fracture-dislocation of the Spine,** with Total Transverse Lesion of the Spinal Cord," discusses most instructively the leading facts which are known about such conditions, and presents an analysis of the chief features of his cases. In one of these cases the postmortem was of singular interest. The junction of the 7th and 8th dorsal vertebræ shows that there was a bend forward at an angle of 45°, the bend seemingly due to decrease in the depth of the body of the 8th vertebra; and it is evident that there had been a line of fracture of a very unusual kind. The right lower articular facet for the rib on the 7th vertebra was detached, and from this point a prominent ridge of callus ran downward and forward and inward to the 7th and 8th bodies. [This article will be found instructive in enabling us to determine whether or not a complete transverse lesion of the cord exists.]

GENITO-URINARY DISEASES.

DISEASES OF THE PENIS AND URETHRA.

Park[2] treated a **tough stricture** by a new method. He made a perineal section, having a filiform as a guide. To this filiform he tied a piece of fine braided silk, and drew the silk forward out of the urethra, and used it as a string saw, after the method of Abbey in dividing stricture of the esophagus.

Fenwick[3] reports a case of great interest. External urethrotomy was performed upon a patient with stricture and sinuses, but the tissues of the perineum were in such a bad state that the bladder could not be found. The bladder was subsequently opened by Cock's method. At a later time a portion of sheep's urethra was transplanted to make up for the loss between the posterior and penile urethra. A sheep's urethra was dissected out while the animal was under chloroform. The anterior end of the deep urethra and the posterior end of the penile urethra were freshened, and a groove was made between them. An elastic catheter was passed into the meatus, and was brought out at the perineal wound. The sheep's urethra was fitted over the catheter and brought up into the prepared groove, and the point of the catheter was pushed into the bladder. The graft was stitched into position, a drain was inserted, and the skin-wound was closed. The continuity of the urethra was entirely reestablished. [The fact that the graft adhered is an exception to the general rule that transplantations from animal to man fail to adhere.]

Fort[4] presents a strong argument in favor of **electrolysis in the treatment of stricture.** Fort's electrolyzer has the advantages of a urethrotome without its disadvantages. The instrument after introduction into the urethra is connected with the negative pole of a continuous-current battery; the

[1] Lancet, Feb. 8, 1896.
[2] Med. News, Nov. 16, 1895.
[3] Lancet, Feb. 8, 1896.
[4] N. Y. Med. Jour., Nov. 16, 1895.

positive pole is applied over the pubes or the front of the thigh, and the current is turned on. The operation is almost painless and lasts about 30 seconds. A current strength of 10 milliampères is used. There is rarely any bleeding, and the instrument does not heat. The urethra is asepticized before and after operation. Pass a sound the 3d day after operation, and another the 4th day, and the patient passes a No. 24 F. every month. The patient is not obliged to lay up after this operation. This process causes molecular destruction of the stricture. Some very hard strictures cannot be successfully treated by electrolysis. Fort has successfully applied electrolysis in the treatment of strictures of the rectum, uterus, urethra, and esophagus. [There seems to be no doubt that Fort has succeeded in applying electricity so as to cure stricture. Former attempts by others were failures, and sometimes made the stricture worse. The trouble seemed to be that any current sufficiently strong to disintegrate a stricture was certain to destroy a wide area of mucous membrane and leave the patient worse off than ever. Fort has unquestionably cured cases—cured them quickly and practically without pain and danger. This method will diminish the number of external urethrotomies, but will not completely do away with the employment of the latter operation in some cases.]

Weir[1] writes upon the **Treatment of Rupture of the Urethra** by Immediate Suture and Bladder Drainage. But few cases of suturing of ruptured urethra have been reported. Suturing is to be urged, though it does not of itself guarantee the patient against a subsequent stricture. The surgeon ought to get rid of the irritant effect of urine. This has usually been sought after by tying in a catheter, but urine is liable to get between the instrument and the urethra, and the retention of the catheter is apt to cause cystitis. Weir drains by suprapubic cystotomy associated with intermittent siphonic drainage. The posterior end of the divided urethra may be found by retrograde catheterization. If the perineal wound is douched for 5–10 minutes with a fine douche of hot water, and also vigorously rubbed with the fingertips, the urethra will become far more distinct. Weir uses Cathcart's apparatus as modified by Keen for drainage (p. 400). Weir reports 2 successful cases. He sutures the urethra with silk, sewing the roof first, then inserting a steel sound, and sewing the rest of the urethra about it. All the layers of the urethra are included in the sutures. There are 29 reported cases of immediate suture of the urethra, all of which were successful.

DISEASES OF THE BLADDER.

Daggett[2] describes a new method of **flushing the bladder and urethra,** which is superior to the plan devised by Feline. The patient is placed semirecumbent, the body at an angle of 45°, and the knees are drawn up. The nozzle is inserted in the meatus. This position favors the flow of fluid into the bladder, and so little force is required that it is only necessary to raise the elevator about 1 foot above the pelvis. When the bladder is filled the patient remains in the same attitude, and empties it by urination. This treat-

[1] Med. Rec., May 9, 1896.

[2] Buffalo Med. Jour., Oct., 1895.

ment is employed in cystitis. Patients with residual urine from enlarged prostate after a number of repetitions of the procedure often become able to entirely empty the bladder (bladder-gymnastics).

Clado[1] thinks that in a person with **enlargement of the prostate cystotomy** is indicated when catheterism is very difficult; when there is a bar at the neck of the bladder, producing partial retention which necessitates the retention of an instrument; when retention of an instrument is intolerable; when vesical paralysis exists; when cystitis, ureteritis, or pyelitis exists; when bleeding villous growths exist upon the bladder-wall.

Elliot[2] writes of **Suprapubic Cystotomy for Vesical Hemorrhage.** In rapid hemorrhage there are three dangers: Rupture of the bladder; obstruction of the orifices of the ureters; the hemorrhage itself. The indications are to perform suprapubic cystotomy, arrest the bleeding, and prevent obstruction of the ureters. If a tumor is found, it is removed; if there is a bleeding vessel, it is ligated; if a varicose vein is ruptured, we rely on pressure or the Paquelin cautery. If the bleeding comes from the posterior urethra, a piece of silk is tied to a soft catheter, the catheter is passed into the bladder by way of the urethra, a plug of iodoform-gauze is attached to the catheter, and the tampon is drawn into place by withdrawing the catheter. Elliot gives the record of a case in which he applied a loose tampon to the bladder.

Cathcart[3] has devised an **exhaustion-pump for siphonage of the bladder** after suprapubic cystotomy. By this apparatus the urine can be withdrawn as soon as it enters the bladder, and can be taken out through the wound or by way of the urethra. We require a pail, some rubber tube, a douche-pan, a Y- or T-glass tube, an S-glass tube, a screw clamp, and an L-shaped piece of glass tube to enter the bladder. The douche-can is filled with water, and is put on a higher level than the bed; the Y-tube is fastened with a safety-pin to the mattress, and the part below the Y hangs down over a pail upon the floor. The screw clamp is unscrewed just enough to permit the water to drop; this water collects in the S-tube, and as its tendency is to run out, it creates negative pressure in the other arm of the Y, to which is attached the tube which is inserted in the bladder. It thus draws urine from the bladder. When the urine and water accumulate to a certain degree in the S-tube there is a flow out and the liquid again accumulates (Fig. 76). [Keen has improved upon the apparatus of Cathcart (see Fig. 77). The change upon Cathcart's plan is "the substitution of the rubber tube, *C*, the glass tubes, *L*, *L*, *D*, and the loop, *E*, for Y- and S-shaped glass tubes, which cannot always be quickly obtained." Keen has devised a still further simplification. Instead of the screw *H*, a knot is tied in the rubber tube *B*. By tightening or relaxing the knot the flow of water is easily regulated.]

Dawbarn[4] has shown that the principle of **intermittent siphonage** was introduced long before the time of Cathcart by Dr. Swan, a dentist of Rochester, N. Y., and dentists have used it for a long period to keep the

[1] La Presse méd., Sept. 28, 1895.
[2] N. Y. Med. Jour., Nov. 9, 1895.
[3] Brit. Med. Jour., Oct. 19, 1895.
[4] Med. Rec., May 30, 1896.

mouth free of saliva. Dawbarn has used a simple apparatus to obtain siphonage for 5 years. He uses only a fountain syringe with several additional feet of small rubber tubing. A clamp is placed upon the side of the tube. By this means the tube caliber is much lessened and fluid will flow in drops. *B* is the joint between the two pieces of tubing, but the connection had best be made by means of a T-tube. We may, if we prefer, cut a circle from the side of the exit tube, sew the end of the other tube to the edges of the opening, tighten the joint with rubber cement, and strap with adhesive plaster. The



FIG. 76.—Exhaustion-pump for siphonage of the bladder (Cathcart, in Brit. Med. Jour., Oct. 19, 1895).

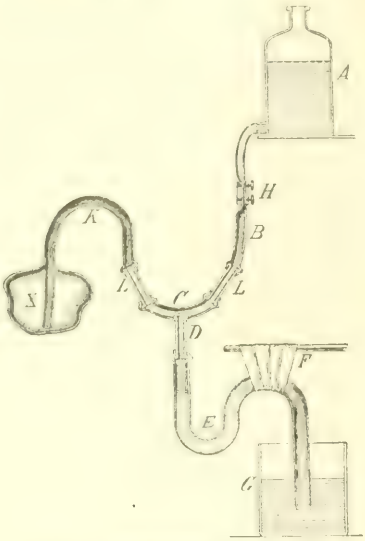


FIG. 77.—Keen's siphonage apparatus: *X*, cavity to be drained; *A*, reservoir; *K*, tube from cavity; *B*, tube from reservoir; *H*, clamp on tube from reservoir; *L*, *L*, *D*, glass tubes; *C*, rubber tube connecting cavity-drain with reservoir-drain; *E*, S-shaped rubber tube maintained in shape by hooking up at *F*; *G*, vessel containing antiseptic fluid.

exit tube is made into a trap by tying it into a loose knot. The water from the reservoir drops down into the trap and gradually fills it. When the trap becomes full, the fluid suddenly siphons off, and this rapid flow creates a vacuum above the trap, and urine is drawn into the tube to fill the vacuum. The process repeats itself at regular intervals. The fountain syringe only needs filling once in several hours.

Bloodgood[1] has devised a new apparatus to permanently **drain the bladder,** or to temporarily drain it, after the operation of suprapubic cystotomy (Fig. 78). The apparatus consists of a rubber bag reservoir. A thicker piece of rubber is sealed to the upper and central portion of the bag; this piece has a small central opening into which the head of the tube is inserted. The abdominal belt prevents dragging upon the bag. Two rubber tubes lead from the bag. The lower tube is to draw off the urine; the upper tube is to wash out the bag.

Briddon[2] reports the histories of 3 cases of **intraperitoneal rupture**

[1] Johns Hopkins Bull., Apr., 1896.

[2] Ann. of Surg., Dec., 1895.

of the bladder. In each case the rent was sutured, but in each case death ensued. Ten years ago Rivington presented a study of more than 300 cases, and in this list are only 2 well-authenticated cases of recovery. In only 1 of these cases was the rent sutured. The proper course in intraperitoneal rupture is to perform celiotomy, close the rent with silk sutures, irrigate the peritoneal cavity with hot sterile water, sew up the upper end of the incision in the belly-

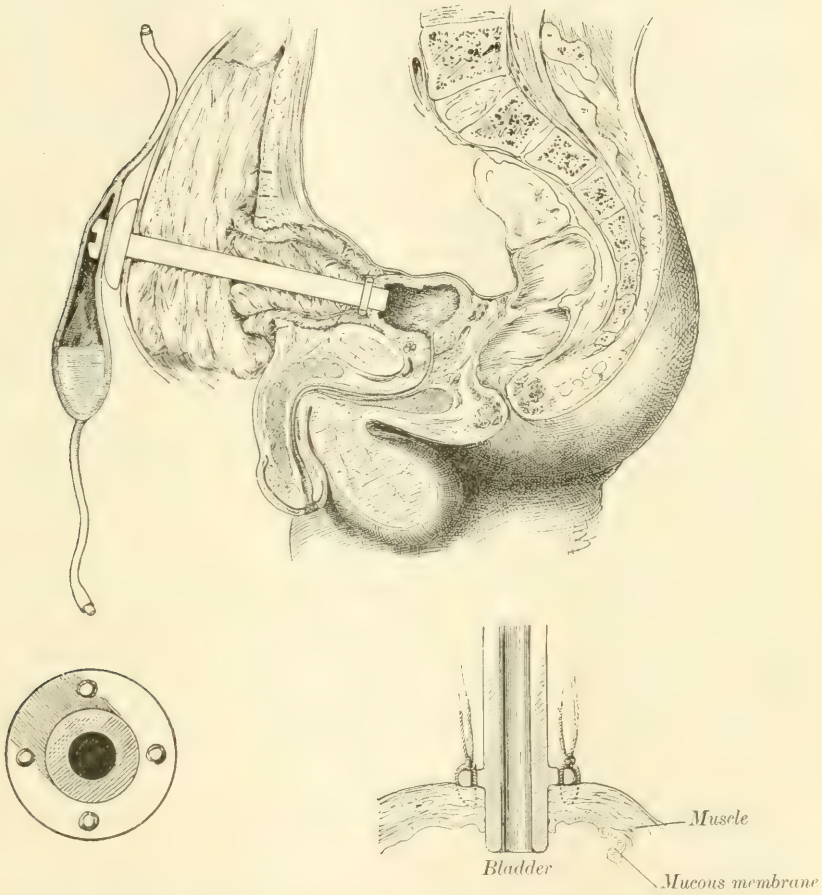


FIG. 78.—Draining the bladder (Bloodgood, in Johns Hopkins Hosp. Bull., Apr., 1896).

wall, tamponade the lower end, carry the gauze to the bottom of the pelvis, and drain the bladder by a soft catheter introduced through a perineal incision.

Heaton[1] writes upon the treatment of intraperitoneal rupture of the urinary bladder. He records a most interesting case in a woman which was cured, and says the symptoms of such an accident are—a history of direct violence to the hypogastrium when the bladder is at least moderately distended; shock and collapse, with sudden and violent burning pain in the lower abdomen; a constant desire to pass water, but with inability to pass anything but a few drops of bloody urine; if active treatment is not adopted,

[1] Ann. of Surg., June, 1896.

increasing distention and signs of fluid in the cavity of the peritoneum. Always remember that any one of these symptoms may be absent.

In cases of doubt the presence or absence of a tear may be settled by injecting into the bladder a measured amount of boracic-acid solution. If the bladder is ruptured, we will be unable to draw out all we put in.

Walsham has lately reported 2 successful cases of operation for bladder rupture.[1] He advises injection of air as suggested by Keen in doubtful cases. If there be a tear, the air will enter the peritoneal cavity, and will show its presence by abolishing the liver dulness. In Walsham's case the injection of air was followed by signs of collapse, the cause of which seems obscure.

Benjamin Bell in 1779 suggested suturing a ruptured bladder, but the operation was first performed in 1876 by Willett of St. Bartholomew's Hospital. Sir William MacCormac did the first successful operation, and the operation has been performed since 37 times. In every case abdominal section should be done, and the patient should be placed in the position of Trendelenburg, so that the intestines will not prolapse into the wound and so hide the bladder. A drainage-tube should not be used unless peritonitis exists. The rent is sewed with silk, as before described. The after-treatment is such as is usually adopted for after-abdominal operations. Most operators insert a catheter every few hours until voluntary micturition returns, but in Sir William MacCormac's second successful case no instrument was used and the patient passed water voluntarily. Out of the 37 recorded cases of abdominal section for vesical rupture, 15 cases are found to have recovered.

Legnun[2] employs **perineal drainage in cystitis** which has not been cured by ordinary methods, and in which suprapubic drainage has only been temporarily beneficial. He introduces a grooved sound into the bladder and opens the perineum by a transverse incision midway between the anus and the bulb. The urethra is opened; an instrument is passed into the bladder; the grooved sound is withdrawn. The posterior urethra is dilated by the passage of a number of instruments until it freely admits the index finger. The neck of the bladder is curetted, irrigation is employed, a Pezza catheter is inserted, and the bladder is drained for 6 weeks. Every week the instrument is taken out, cleaned, and reinserted. Every day the bladder is irrigated.

Robson[3] records a case of bladder so contracted that it could hold only $\frac{1}{2}$ an ounce of fluid. By gradual fluid dilatation the capacity of the viscus was increased to 8 ounces. Every day the bladder was injected with a solution of boracic acid, moderate force being employed with the syringe. Twice the patient was anesthetized and fluid forced into the bladder.

Fenwick[4] writes upon the clinical significance of the **simple solitary ulcer of the urinary bladder.** He says that 8 years' use of the cystoscope has taught him that simple ulcers are not unusually met with, which are wrongly considered to be tubercular and incurable. Fenwick relates the case of a man of 20 who came to him 8 years ago because of constant pain in the

[1] Trans. Med.-chir. Soc., vol. lxxviii.
[2] Ann. d. Mal. d. Org. Genito-urin., 1895, p. 1065.
[3] Brit. Gynæc. Jour., Aug., 1895.
[4] Brit. Med. Jour., May 9, 1896.

penis and intermittent hematuria. The cystoscope showed an ulcer the size of a shilling upon the posterior wall behind the interureteral bar. The edge was raised and gelatinous; the base was bloodstained and sloughy. The patient refused operation, and yet recovered. This case drew Fenwick's attention strongly to the subject, and since then he has seen many cases of solitary ulcer. Most of them have been young men of about 20, without a venereal history. The first symptom is increased frequency of micturition, coming on suddenly; intermittent hematuria then appears. The most marked feature is constant pain in the penile urethra, which pain is much aggravated by exercise, micturition, or holding water long. The life-history of the solitary ulcer is divided into 3 stages: 1. Before the onset of cystitis; 2. The stage of cystitis; 3. The stage in which the bladder is contracted and inelastic, with mucous membrane more or less destroyed, the ureters and kidneys involved. In the first stage the urine is acid, the specific gravity still high, and pus not present in any amount. In the second stage the ulcer becomes encrusted with phosphate, and pieces of the crust break off now and then, and are passed with painful paroxysms or are retained and form calculi. In some bladders, especially female bladders, "contact" ulcers are apt to form. An ulcer forms on the anterior wall corresponding to the one on the posterior wall. The disease ought to be recognized in the first stage. We may be sure it exists without using a cystoscope, but, nevertheless, this instrument ought to be invariably employed to make certain the differential diagnosis. "In the solitary ulcer the sheen of the rest of the bladder is perfect, and the capacity is normal. In tubercle the posterior wall is patched with areas of vivid red, and peeling from them are the white flakes of necrotic tissue, whilst the capacity of the bladder is reduced at the very outset." Tuberculosis is clinically indicated if the urine is pale, murky, neutral, of a specific gravity of 1010, if there is much nocturnal irritability of the bladder, if there is a record of maternal phthisis. Solitary ulcer is clinically indicated if the urine is clear and natural colored, of a specific gravity of 1020, if there is constant penile pain and no nocturnal irritability. The prognosis of the solitary ulcer is good, and it may even heal spontaneously. Treatment in the first stage consists in the administration of oil of sandalwood, followed by the use of maltine and cod-liver oil. Fresh air and nutritious diet are insisted on, and small doses of mercury are given at night. It may become necessary to curet the ulcer. In the second stage the bladder may be irrigated with acids, nitrate of silver, or 1% lactic acid. The best thing to do in men is to perform a perineal or a suprapubic cystotomy and scrape the ulcer. In women scraping can be done without a cystotomy. It may be necessary to scrape these ulcers a number of times. A tuberculous ulcer would be made worse by the use of the curet.

Fenwick[1] says a **cystoscope** should be used in every case in which tumor of the bladder is suspected, and should be used in an interval between attacks of hematuria, so that the urine will be found clear. The surgeon should be prepared to operate at once after cystoscopy. In women pedunculated papil-

[1] Med. Press and Circ., Oct. 9, 1895.

lomata can usually be removed by way of the urethra, but the surgeon before operating should obtain permission to open the bladder if necessary (either through the vagina or above the pubes). In men the suprapubic cut is always necessary. In every growth with a pedicle the base must be thoroughly removed by cutting or by both cutting and crushing. The curet is only used upon large sessile areas or small secondary foci. Bleeding is arrested by the silk ligature (the long end left hanging out of the wound) or by the cautery applied through Keith's tube. In carcinoma we may delay the progress of the case if the disease be a hard, single, slow-growing mass, by removing with a knife the tumor base and the submucous tissue. It is useless to try and remove malignant growths which are on or about the trigone: the attempt can only do harm, and the surgeon should rest content with suprapubic drainage. Rectal and bimanual examination under ether will enable us to detect the presence of infiltrating growths. Multiple growths and "contact" growths should not be operated upon. Small malignant growths which are solitary and slow-growing can be removed even if they have reached the vesical muscle, but the whole thickness of the bladder-wall must be taken away with them. (This can be done only in the anterior, lateral, and posterior walls of the "middle zone.") If the peritoneum is removed, the bladder must be freely drained. Fenwick publishes the record of 70 cases of operation for vesical tumors (these include recurrences) with 5 deaths. Only 2 deaths were caused by the operation.

Brown[1] publishes a case in which he removed a stone by suprapubic incision, closed the bladder-wound with a continuous silk suture, and obtained primary union. Ten months later the man returned because of retention caused by the impaction of a calculus in the prostatic urethra. Perineal section was performed, the stone was removed, and it was found that **a piece of silk was the nucleus** of the mass. The silk had evidently passed entirely through the mucous membrane into the bladder.

Browne[2] says that the history of surgery is full of mistakes in **the diagnosis of vesical calculi.** Mistakes are thought to be due to the fact that a stone eludes recognition by lying in a sacculus in the posttrigonal pouch or in the postprostatic hollow. There is yet another spot where it may lie and escape detection. When we have a lateral enlargement of the prostate a pouch is formed between this enlargement and the bladder-wall, and in this pouch a stone may lie. Browne reports 3 cases. Mr. Cadge of Norwich in 1886 called attention to this fact. A stone in this situation may be missed by the sound, or may be felt by the sound and yet be unseizable by a lithotrite.

Richardson[3] records 2 cases in which he performed **intraperitoneal suprapubic lithotomy.** In very large stones the bladder may undergo such changes that an extraperitoneal operation becomes impossible, because the peritoneal reflection is found not well above, but behind or below, the pubes. This condition is due to inflammation: there is permanent thickening, and the

[1] Lancet, Feb. 22, 1896.

[2] Brit. Med. Jour., Oct. 12, 1895.

[3] Ann. of Surg., Feb., 1896.

bladder lies contracted down upon a large stone. In these cases we must take the intraperitoneal route. In Richardson's 2 cases there was no idea before operation that it would be necessary to cut the peritoneum, but the peritoneal cavity was opened at once. Both cases recovered.

Richardson concludes his paper by saying: "If further experience in intraperitoneal cystotomy shows, as I believe it will, that the dangers of peritonitis can be successfully avoided, it seems probable that the method used in the cases above reported will have an application considerably wider than it has thus far had; for in many cases of bladder tumor, of enlarged prostate, and of stone the opening in the prevesical space will be found insufficient for satisfactory manipulations. The range of the method, however, will be limited to those cases in which the perineal or urethral routes are either impracticable or injudicious, and in which the ordinary suprapubic extraperitoneal method is not feasible."

Albarran[1] of Paris reports **80 cases of lithotrity with only 1 death.** The oldest patient was 84, and he was operated on with success under cocain, general anesthesia being feared because of the existence of aortic disease.

Lithotrity in cases of stone is most ably and elaborately reviewed by Herbert Milton of Cairo.[2] In all simple cases of stone, whether in adults or in children, he considers Bigelow's operation, if in *expert* hands, the best procedure. By a simple case he means a stone of *moderate* size and density situated *in* the bladder of an adult or adolescent whose urethra is of normal size, and who has not any other important disease of the urinary organs or general system. A stone of moderate dimensions does not weigh more than 2 oz., and can be broken with a No. 12–14 instrument. A *normal* urethra readily admits an instrument of 12–14 English scale. Cases which do not conform to these conditions are complicated. He refers to complications arising from—1. Size and hardness of stone; 2. Position of stone; 3. The incomplete development of childhood; 4. Old age and its degenerations; 5. Pathologic conditions of the urinary organs; 6. The general state of the patient. The older the patient, the more dangerous the operation, provided we estimate age rather by the conditions than by the years lived. He has performed urethral lithotrity 141 times, with 3 deaths. One of the fatal cases was over 80; the second was 55, but the patient had a sacculated bladder and fetid cystitis; the third was only 35, but his kidneys were far gone with disease.

The method of Keith—that is, incising the urethra from the perineum, and passing a lithotrite from this cut through the remainder of the urethra into the bladder—should only be employed when it is impossible to introduce a lithotrite through the penile urethra. The method of Dolbeau—opening the urethra from the perineum, stretching the remainder of the tube by a dilator, and inserting a large crusher into the bladder—has not given good results. The best operation for the general surgeon to employ when attacking large stones is to open the bladder through the perineum, and through this wound crush the stone. The incision into the bladder is by the left lateral

[1] La Mercredi médicale, Nov. 6, 1896. [2] Lancet, Apr. 18–25, and May 2, 1896.

cut, and the crushing of the stone before extraction prevents much damage to important strictures.

The results obtained upon children by crushing have been remarkably good. Milton's personal experience has been small, but the truth of above statement is found in the records of Keegan and Freyer. The method should be applied to children by experts, but the general surgeon will get better results by lateral lithotomy. Gilbert Barling has published some very interesting statistics in regard to operations upon children, and these statistics indicate that the suprapubic operation is far more dangerous than many surgeons will acknowledge. Barling gives the results of 152 operations performed upon children under 10 years of age between 1888–92:

Litholapaxy,	43 cases, with	1 death.
Suprapubic lithotomy,	46	"	10 deaths.
Lateral "	48	"	2 "
Median "	15	"	1 death.
	152 cases, with	14 deaths.

The greatest difficulty the surgeon meets with is in old age, and stone-operations have a high mortality. Old men are apt to have kidney-disease, cystitis, vesical atrophy, obstruction from prostatic enlargement. These cases should not be operated upon if it seems probable that operation will produce immediate death; otherwise operation is to be advised. Crushing is the preferable operation, as it is decidedly safer. The two great dangers to be avoided are bruising by the too frequent introduction of instruments and over-distention of the bladder.

In some instances of retroprostatic pouch suprapubic lithotomy must be performed. When a stone coexists with marked prostatic enlargement, it is a matter of consideration whether it is not advisable to do a suprapubic, remove the stone, and also the prostatic enlargement. We must remember, however, that suprapubic lithotomy is more fatal than litholapaxy—that when a stone is present it is hard.

Harrison[1] says the only class of patients who may be easily **harmed by sounding** are those with enlarged prostates. Such cases should be sounded with great care, and everything should be ready for operation, so that if a stone is found the surgeon can proceed at once. Lithotrites should be strong and fenestrated, and their crushing power should be known. He believes, as does Milton, that in most cases the lithotrite should not be withdrawn until crushing is completed. When the prostate is enlarged a straight evacuating tube is used; in other cases curved tubes are best. If the urine is fetid and full of bacteria, wash out with 1 : 3000 of silver-nitrate solution. This plan was proposed by Guyon.

DISEASES OF THE PROSTATE, VAS DEFERENS, SEMINAL VESICLES, TUNICA VAGINALIS, AND TESTICLES.

Albarran[2] discusses **castration in hypertrophy of the prostate.** He concludes that when chronic retention exists, when retention is complete,

[1] Med. Chron., Oct., 1895. [2] Ann. des Mal. des Org. Gen.-urin., Dec., 1895.

or when there is a large amount of residual urine catheterization should be tried as a cure of the case, and when this fails or when the patient is very difficult to catheterize castration should be advised. [We have been confirmed in the view expressed in the *Year-Book* for 1896, that most cases can be well treated by the catheter, but that some few cases cannot; that the value of White's operation has been definitely proved; and that it has a future field of great usefulness. The abuse of the operation has led some conservative men to oppose it, but the abuse of an operation is not a scientific test of it. White himself has been very careful in all of his articles to show that only a certain number of these cases should be subjected to castration. When we properly select the cases the operation is reasonably safe, and is rapidly curative in most instances.]

Mayer[1] records some further experience as to the effect of simultaneous **ligation of both internal iliac arteries for hypertrophy of the prostate gland.** He has done it 3 times, and 2 of these cases were noted in the *Year-Book* for 1896. One patient was partially improved; 1 died from an unknown cause 7 days after operation; the 3d has not been improved at all. It should be remembered, however, that the 1st case suffered from secondary hemorrhage and the formation of a retroperitoneal abscess, yet in spite of these troubles the operation has not been in vain. It does not seem probable in the 2d case that the operation was the immediate cause of death. In the 3d case the artery was successfully tied on the one side only, and this was followed by a marked atrophy of the left lateral lobe of the prostate.

Isnardi,[2] who performed the first operation of **bilateral ligature and exsection of the vasa deferentia** in the treatment of hypertrophy of the prostate, discusses this question afresh. He has performed the operation 14 times, and he gives a record of the last 12 cases, the first 2 having been reported: 1 of the patients suffered from cancer of the prostate and committed suicide, and 1 died 9 days after the operation. Of the remaining cases, in 2 the operation was done on one side, in 9 it was done on both sides; 8 were cured of the dysuria, 2 were much improved, and 1 was not benefited. Guyon has reported 3 cases of this operation, in 2 of which the success was noticeable. Routier has reported 5 successful cases. Bussachi has operated in 3 cases with marked benefit. Chabot has reported a successful case. [We believe Mears was the first to suggest this operation.]

Burnett[3] has reported a case of a man of 35 who was operated on for stone at the age of 5. In this operation the **ejaculatory ducts** were **torn** across, becoming permanently occluded, sterility ensuing. As a result there had been an arrest of development of the prostate gland and seminal vesicles.

Spalinger[4] makes a comparison of the results obtained in the radical **treatment of hydrocele by iodin injections.** In 78 cases in Zurich, 48 were treated by iodin; of these 30 were cured, 5 relapsed, and 13 were lost

[1] Ann. of Surg., June, 1896.

[2] Therap. Woch., No. 21, 1896.

[3] Med. News, June 29, 1896.

[4] Beiträge f. klin. Chir., Bd. xiii. Heft S.; Centralbl. f. Chir., 1895, No. 27.

sight of. In 17 operations in which incision was practised, 12 were cured and 5 were lost sight of. Not one was known to have relapsed. [The open operation is the safest and best. It is the only one that permits us to promise cure.]

Lawrie[1] has devised **a new method for operating for hydrocele.** The sac is tapped in the usual way; about $\frac{1}{3}$ of the fluid is allowed to flow off, when 2 drams of a saturated solution of mercuric chlorid and glycerol are injected and mixed with the fluid which remains in the sac, and this combination is allowed to remain in the sac for $\frac{1}{2}$ to 1 minute, and the whole of it is then drawn off.

Lockwood[2] makes a strong and convincing plea for the performance of **radical cure of hydrocele by excision of the sac.** During the 10 years from 1885 to 1894, inclusive, 113 cases of hydrocele were treated by operation in the wards of St. Bartholomew's Hospital. Only 13 of these were subjected to incision; 48 were injected with iodin; 45 are said to have had a radical cure done; and 7 were treated with setons. There is no doubt that the 45 who were said to have had a radical cure done had the hydrocele injected with iodin, black wash, or phenol, or some other agent. Hydrocele is such a common disease that it is remarkable that only 110 cases have passed through the wards of this great hospital in 10 years.

Moullin[3] considers some of the recent results of **orchotomy for enlarged prostate.** He reviews his experience of 12. Of these there were 2 deaths shortly after the operation; 1 died from heart-failure on the 9th day, and the other died on the 15th day from rupture of the middle cerebral artery; 2 others died 6 months after the operation, but they would have died sooner had the operation not been performed; 2 others nearly died, not from the immediate shock of the operation, but from a form of traumatic delirium. That this traumatic delirium is not due to the loss of any specific power of the gland or of any substance which the gland forms and throws into the circulation is shown by the fact that in 2 of the recorded cases it followed unilateral orchotomy. In every case, even that of the patient who died upon the 5th day, the obstruction was diminished. In 1 of the patients who died examination after death showed that the mucous membrane that covered the vesical surface of the growth was wrinkled, and the flattened shape of the protruding prostate showed that it had been reduced in size. The microscope showed no evidence of gland-atrophy. The improvement that took place in these cases cannot be accounted for by rest in bed or other palliative measure. In all but 1 case voluntary power of micturition was regained, and residual urine fell below 2 ounces. In 1 of the patients who died postmortem examination showed the presence of a calculus which had not been suspected during life. As Moullin has met with several instances of a similar character of unsuspected calculi lying behind an enlarged prostate, he has always made a practice of specially examining for them when the symptoms are either severe or pro-

[1] Lancet, June 13, 1896.

[2] Ibid., Oct. 19, 1895.

[3] Ibid., Feb. 8, 1896.

longed; 18 months ago he suggested to Prof. Clark of Glasgow that relief in enlargement of the prostate might be obtained by removing one gland. When the enlargement does not involve the median portion, but when the obstruction is caused simply by the size of the lateral lobes, he suggested that unilateral orchotomy might suffice. Since then Mr. Manning of Salisbury has done it with great success in a case; 1 or 2 successful cases have been recorded in America. If it can be shown that double ligature in section of the vas deferens acts as well, patients would probably agree to it more willingly than the other operation. We well know that section of the vas may or may not cause atrophy of the testes. The prostate appears to invariably atrophy to some degree. Both Pavone and White have proved this statement upon animals. Harrison was the first to divide the vasa deferentia in a case of enlarged prostate; 6 or 7 years later the man was alive and well. Tilden Brown ligatured both vasa deferentia under cocain in a man 72 years of age, with decided benefit. Guyon has operated twice, and Legueu once, with a certain amount of improvement, and Isnardi has also operated twice.

In another article by Moullin[1] we find a consideration of **unilateral orchotomy for enlargement of the prostate.** He says that he has recently removed the median lobe of the prostate gland in an old man who was to all intents and purposes a monorchid, for shortly after birth the left testis had been subjected at the hands of an attendant to a proceeding similar to bistourage, and as a consequence had wasted away. This case is of much interest in connection with the question of the value of the operation of unilateral orchotomy. It shows definitely that after one testicle has been lost in infancy obstruction from enlargement of the prostate may still occur later in life. We should note, however, that the cord was not divided high up and ligatured as in the operation of castration. The results, so far as the prostate is concerned, of removal of the testis alone and removal of the testes and a greater part of the cord by operation may be identical, but, though it is usually done, this should not be assumed without further evidence. Improvement has certainly taken place in some cases after unilateral orchotomy, and this may be explained by the difference in the development and growth of the prostate in different individuals. In man the prostate is in its inception a double organ: it is developed in connection with the vasa deferentia and the two sides remain more or less distinct. The seat of origin is displaced until the tubules of the gland seem connected with the urethra rather than with the ejaculatory ducts, and the two halves approach each other until, like the uterus in women, they fuse together. The degree to which the fusion varies in different people is in all probability a measure of the extent to which each testis controls the entire gland. In a patient in whom the enlargement is confined strictly to the lateral lobes unilateral orchotomy may succeed, but when there is a median outgrowth it can be of little use. The deduction is obvious that an accurate diagnosis of the special kind of enlargement is required before the unilateral operation can be condemned. Experiments to determine this point

[1] Lancet, Feb. 1, 1896.

which are made on animals in which the fusion is less complete than it is in man are of no use, for the conditions are not the same.

Kümmel[1] reports 8 of his own cases and 59 others in which **castration** was performed **for hypertrophied prostate.** He considers that the value of the operation is definitely established. He has never noticed any traumatic delirium follow the operation, and permits his patients to get up out of bed the next day.

Harrison,[2] as to **division of the vas deferens in obstructive prostatic hypertrophy,** says that a casual case of this kind came under his care some years ago and has since been reported, and in this case he practised this procedure. There is also collateral evidence in favor of the operation. Birkett and Hilton have shown that if the vasa deferentia is sectioned or ruptured atrophy of the testes results. It seems certain that in many prostatic cases it takes but a small amount of gland-shrinkage to make the difference between a life of comfort and a life of misery. Harrison is disposed to think that division of one vas or both vasa will in many cases provide the necessary relief, but even if this minor procedure should fail, the surgeon is still able to resort to castration. He discusses the effects noted as having followed the division of one vas or both vasa in the human species. In the course of a few days, as a rule, the testis shrinks or softens, and rectal examination detects analogous changes taking place in the prostate. In some cases the prostatic changes have been favored by the introduction of a catheter which followed. He has further noted that the intervals between micturition become prolonged, often double, and there is a reduced liability to bleeding and cystitis, and the urine becomes gradually normal both in appearance and composition. Prostatic spasm ceases. Some of the effects are due to diminished blood-current through the prostate.

Alexander[3] combines **perineal prostatectomy with suprapubic cystotomy.** He makes the perineal section to include the growth there, and does the suprapubic cystotomy to enable him to press down the prostate by means of the fingers, so that it can be readily included through the perineum. The mucous membrane of the bladder is not cut. At the termination of the operation the drainage-tube is carried through the cut membranous urethra into the bladder, and is allowed to remain in position for 10 days, and suprapubic drainage is also employed for the first week.

DISEASES OF THE URETER AND KIDNEY.

Kelly[4] discusses the **diagnosis of renal calculus in women.** He tells us that there is an increasing frequency of operation upon the kidney, and that serious errors of diagnosis of renal calculus are often made. The patient may have a persistent lumbar pain, blood or pus in the urine, or a retroperitoneal lumbar tumor, and yet be free from stone. The presence of pus is very significant, but when gathered from the bladder it is impossible

[1] Berl. klin., 1895, Heft 86.
[2] Feb. 22, 1896.
[3] N. Y. Med. Jour., Feb. 8, 1896.
[4] Med. News, Nov. 30, 1895.

to see from which side the pus comes. Even when the degeneration and swelling are on one side, we cannot by the ordinary methods of examination assert that the other side is completely healthy. In order to diagnose the presence of stone in the kidney, we should catheterize the ureter under direct inspection of the bladder, the bladder being distended with air by the posture of the patient. In order to gather enough urine, the catheter should be left in the ureter from a quarter of an hour to several hours. We thus determine the condition of the urine gathered from each catheter. In addition to this we should examine by means of renal bougies. For this purpose renal catheters and renal bougies should be used.

Sutton[1] says that the ureter is a muscle traversed by a channel lined with epithelium. The muscle of the **ureter** is continuous at its lower end with the muscle of the bladder, and **waves of rhythmical peristaltic contraction** pass along from the kidney to the bladder. Foster speaks of these waves as "beats," and they are subordinate to the flow of urine into the pelvis. The more active the secretion of urine the more frequent and vigorous are the beats. The ureter is not a passive conduit, but urine is conveyed along it on the same principle that fluid is conducted along the esophagus. These rhythmical contractions and their power have been studied in cases of exstrophy of the bladder. A jet of fluid has been seen to issue from the ureteral orifice 5 cm. high. The jet from the two openings may be synchronous or occasionally alternate, but, as a rule, independent in time and variable in force. Sutton records 2 cases to prove that great and unusual suffering may result from increased peristalsis of the ureter. In both of the cases it was found necessary to remove the kidney. It is an interesting fact that hydronephrosis is usually accompanied by frequency of micturition, and this is due to the fact that the beat of the ureter is exaggerated and the muscular contraction passes on to the bladder, causing vesical irritability.

Krause[2] reports a case of **fistulous communication between the ureter and the vagina.** The difficulty began after an operation for cancer. Krause opened the abdomen, divided the ureter above the fistula, and implanted it into the top of the bladder, which organ he had previously incised over a sound. He pulled the ureter into the bladder by means of a pair of forceps, and fixed it by sutures which did not penetrate the mucous coat. The patient made a good recovery.

Kelly[3] reports a case in which he performed **anastomosis of the ureter into the bladder.** After he had removed the diseased portion of the ureter he found that the part left was so short that even when he pulled upon it he could not bring it in contact with the bladder. He did not attempt to suture it to the bladder against such strong traction, as it would have separated. He freed the bladder from its attachment to the horizontal ramus of the pubis on each side. This enabled him to carry the bladder farther back in the pelvis by at least 3 cm. After having done this, he found that the ureter

[1] Lancet, May 9, 1896.

[2] Centralbl. f. Chir., 1895, No. 9.

[3] N. Am. Pract., June, 1896.

and the bladder could be easily brought together, and he proceeded to do so. The patient made an excellent recovery.

Borri[1] made a series of experiments upon dogs in the **implantation of the ureters into the intestines,** and in these experiments he used a button. The ureter is fastened about one end of the button, which is then introduced into the bowel through a small longitudinal cut, and is afterward penned up. The bobbin passes through the intestines and is discharged. He has done this successfully upon 2 cases. One was a case of tuberculosis of the bladder, and the button passed on the 8th day. Urine appeared from 16 to 24 hours after the operation, and hence afterward appeared at 2- or 3-hour intervals. In the 2d case, which was a vesico-vaginal fistula with absolute obstruction of the urethra, the button came away on the 12th day. Both cases made an excellent recovery.

Implantation of the Ureter in the Bladder.—Westermark[2] reports a case in which he operated for cancer of the cervix in the vaginal vault. He made a complete extirpation of the uterus and its appendages through a peritoneal incision. He was obliged to divide the left ureter and remove its peripheral end, together with a piece of the bladder. He closed and packed in the bladder by two layers of catgut sutures. The first layer included the superficial and muscular layers. The next layer was placed close above the other and included the superficial layer. A small opening was left in the angle of the wound, and into this the proximal end of the ureter was sutured with catgut. The needle was then passed through the outer layers of the bladder, so as to include the muscular coat, but not through the mucous membrane; then through the cut end of the ureter except mucosa, 4 mm. upward, and out through the wall; 4 sutures were passed by this method. We see that this method placed the muscular layer of the ureter in direct apposition to the same layer of the bladder, and the connective tissue of the ureter in apposition to the connective tissue of the bladder. A new layer of sutures was now made to cover the first layers. The patient made an excellent recovery.

Roberts[3] reports an interesting case in which he successfully performed **transperitoneal ureterolithotomy.** After cutting through the posterior layer of the peritoneum and lifting up the ureter, he protected the surrounding parts as much as possible and made a small opening into the ureter. He used a uterine sound, and readily passed it into the bladder, its presence there being proved by contact with a ureteral sound introduced into the bladder. He passed it upward and came in contact with a hard substance. He succeeded in causing this stone to emerge through a cut by stripping down the ureter with his fingers. The opening in the ureter was closed with silk sutures, and the peritoneum over it was closed with a continuous catgut suture. A drainage-tube was used because of the possibility of the sutures not holding. The patient made an uneventful recovery.

Tuffier[4] writes upon **partial nephrectomy** for benign tumors of the

[1] Il Policlinico, Oct. 1, 1895.
[2] Hygeia, No. 3, 1895.
[3] Ann. of Surg., Sept., 1895.
[4] Gaz. des Hôp., No. 126, 1895.

kidney. He has performed this operation in 5 cases, twice for innocent tumors, once for renal cyst, once for a kidney traumatism, and once for calculous pyonephrosis. In infiltrating tumors or tumors which are very adherent we should not attempt excision unless they are a considerable distance from the hilum of the kidney. The lumbar incision is the proper one, and hemorrhage can be arrested by temporary compression of the pedicle. The kidney must be entirely stripped from its surrounding mass of fat, and after the excision is completed it must be sutured.

Traumatism of the Kidney.—Schroeder[1] records the fact that Kölliker performed an operation upon a boy who had been injured 9 days before and who had symptoms of rupture of the kidney. A lumbar incision was made, and he found a great laceration in the kidney with sloughing edges. The upper third of the kidney was by this gap almost separated from the rest of the organ. A drainage-tube was carried into the kidney, and the entire wound was filled with iodoform-gauze. The drain was removed after 5 weeks, and the wound healed entirely in 7 weeks.

Keen[2] on the **treatment of traumatic lesions of the kidney** tabulates 155 cases compiled for him by Spencer. His tables begin where those of Maas end—that is, in 1878. He discusses gunshot wounds of the kidney, wounds of the kidney other than gunshot, and subcutaneous rupture of the kidney. The total number of cases of rupture of the kidney which appears in the table is 118. One case was under treatment when reported, and the result is not known; therefore he considers 117 cases. In these there was a mortality of 42.7%. If we are to judge rightly of the mortality, the following cases should be deducted: 1 in which the other kidney was absent; 2 in which both kidneys were injured; 2 in which the patients were found dead; and 12 which died of other additional injuries. This leaves a mortality of 33%. When no nephrectomy was done there were 13 early deaths—11 from shock and hemorrhage and 2 from peritonitis. There were 10 late deaths, of whom all died from septic causes, except 2, who died, 1 from continuous and the other from secondary hemorrhage. Had nephrectomy been done in these 23 cases, it is fair to presume that 10 of them would have recovered, which would reduce the mortality to 23%.

One of the most important things to determine is whether nephrectomy should or should not be done. The tables show a difference of 8% in favor of nephrectomy, although this operation was only performed in the most serious cases. If we count in the 13 cases which nephrectomy might have saved and the 10 late deaths, some of which early nephrectomy would have prevented, the percentage of mortality would be 33.2% against 44.2%, a difference of percentage of one-fourth. The value of nephrectomy as a life-saving operation is all the more evident when we remember that the large majority of the cases in which no operation was done were the slighter cases of injury; when nephrectomy is not done even these slight injuries show a mortality greater than the gravest injuries in which nephrectomy was done. Secondary nephrec-

[1] Münch. med. Woch., Aug. 6, 1895, p. 751.

[2] Ann. of Surg., Aug., 1896.

tomy is nearly twice as fatal as primary nephrectomy. The paper seems to indicate that lumbar nephrectomy is the safer operation. The duty of the surgeon seems clear. When the symptoms are positive, especially if there be marked evidence of hemorrhage or probable danger of sepsis, an exploratory operation should be done at once, and whether or not nephrectomy is to be done will be determined by the conditions already stated. In any case with severe and dangerous symptoms the surgeon should lean toward exploration, and in severe laceration toward early nephrectomy.

Fenger[1] as to the **conservative treatment of sacculated kidney** advised the use of a lumbar incision, and subsequent operation for the removal of valve formation in the ureter if this was found to have caused a hydronephrosis. By removing this valve we obtain a patent canal. He reported a cure of valve-formation between the sacs of a sacculated kidney. He incised the walls between the sacs, and thus produced a single sac which communicated with greater freedom with the renal pelvis. He also reported a case in which he successfully removed a portion of the kidney for tuberculosis, instead of removing the entire organ.

Franks[2] presents a most able study of the **causes and symptoms of movable kidney.** The operation which he most approves is the suture of the kidney to the 12th rib. It is known that when the kidney is hardened in situ its upper margin is marked by a groove where it is clasped by the 12th rib, and this seems to be a clear indication as to the proper position the sutured kidney should occupy. Franks sutures with catgut. He follows the plan of Lloyd, dividing the capsule of the kidney at the place where it is proposed to pass the sutures. He partially strips it off, and sutures the capsule to the renal parenchyma and the wound or to the last rib. The patient should be kept in bed for at least 6 weeks. [Access to the kidney is obtained most readily by the operation of Edebohls. The patient is placed upon his belly with the legs partly flexed. Between the belly and the bed is a rubber cylinder 9 in. in diameter, distended with air. A vertical incision is made along the edge of the erector spinæ mass, and the fatty capsule of the kidney is divided. The patient is then pulled down toward the foot of the bed, the rubber cylinder being kept from moving down. The chest now rests upon the cylinder, and is fixed by it, and the respiratory movements of the diaphragm force the kidney out through the wound, unless, of course, the kidney is enlarged.]

Casper[3] advocates the **treatment of pyelitis** with irrigations of the ureters. He makes the diagnosis by catheterizing the ureters, and then irrigates the bladder and the pelvis of the kidney with silver nitrate of the strength of 1 : 1000 at intervals of 4 days. He records several cases which promptly recovered.

Rovsing[4] says that since Kocher's first operation, 18 years ago, the **kidney** has been **removed** 150 times for malignant tumor, and the mortality has been 50 to 66% before 1890, and between 20 and 25% since that period. The

[1] Ann. of Surg., June, 1896.
[2] Brit. Med. Jour., Oct. 12, 1895.
[3] Allg. med. Central. Zeit., 1895, No. 77.
[4] Arch. f. klin. Chir., Bd. xlix. Heft 2.

large mortality is due to the fact that diagnosis has been made late instead of early.

Legueu[1] has collected 20 cases which he calls **renal neuralgia** in which operation was done; nothing was found, and yet the condition was permanently cured. One point in the diagnosis of these latter cases should be that the urine is sterile and contains no pus. He says that, whereas in the vast majority of cases we should be able to reach a correct diagnosis, when there is doubt as to whether we are dealing with tumor or a calculus we should make a lumbar exploration. If stone in the kidney is accompanied by suppuration, operation is absolutely indicated, since life is threatened. If suppuration does not exist, operation may be deferred. Severe hemorrhage or frequent hemorrhages or agonizing pains make operation perfectly necessary, but there are some chronic cases in which this operation is not imperatively demanded. The author then discusses the palliative treatment and the operations. He tells us that incision of the pelvis of the kidney causes but little bleeding, and does not injure the parenchymatous structure of the kidney, but, unfortunately, this incision does not permit us to remove calculi which are in the parenchyma and the calyces of the kidney, and that a permanent urinary fistula is very likely to follow. Nephrolithotomy enables the surgeon to remove all concretions, whether they lie in the pelvis or in the parenchyma. When suppuration is absent this wound in the kidney should be used, but when suppuration is present the wound should be drained and partially sewn. Hemorrhage can be prevented by temporary digital compression or by compression of the instrument. Extirpation is only exceptionally needed. We employ it when the kidney-substance is extensively destroyed, and when the fact that the later urine contains a large amount of urea shows us that the other kidney is fit to undertake the task alone. The mortality of nephrectomy for stone is 40%, and this is usually due to the fact that the other kidney is diseased and breaks down under the strain. The prognosis is good—7 deaths out of 115 cases.

Albarran[2] in discussing the treatment of **movable kidney** thinks that orthopedic apparatus are of the very greatest value. Belts are of great use. They may require to be fitted again. They often make the patient entirely comfortable. He believes in operating if the apparatus fails to give relief or if the movable kidney is also diseased. Often when the kidney causes pain a well-padded belt will make the patient comfortable. In neurasthenia or hysteria when a belt or drainage fails we are justified in operating. Even if an operation is done, a belt should be worn.

Meyer[3] in an article upon **"The Early Diagnosis of Tuberculosis of the Kidney"** says that when tuberculosis is advanced to a certain stage cystoscopy of the bladder would be absolutely the diagnosis of primary descending tuberculosis. We find a healthy surface of the vesical mucous membrane and one normal ureteral opening. The other ureteral mouth is injected, and between it and the slightly hyperemic trigone we see a number of circum-

[1] Arch. f. klin. Chir., Bd. li. Heft 4. [2] Ann. des Mal. des Org. Genito-urin., July, 1895.
[3] Med. News, Mar. 7, 1896.

scribed inflammatory areas of the mucous membrane, the interposed tissue being unchanged in appearance. Meyer compares this appearance to foot-prints in freshly fallen snow. No other disease of the bladder presents a similar cystoscopic appearance.

WOUNDS, BURNS, ULCERS, AND PLASTIC SURGERY.

Neebe[1] uses zinc-jelly bandage very largely in **the treatment of leg-ulcers.** In addition to this he applies iodoform or weak silver-nitrate ointment to the ulcer. If the floor of the ulcer is necrotic, Neebe holds that mercury and carbolic mucilage should be applied to it until the slough separates. For the treatment of excessive granulation he applies a preparation containing 1 part of silver nitrate, 10 parts of balsam of Peru, 100 parts of vaseline. This ointment greatly aids cicatrization. The zinc-jelly bandage is changed about once a week. [In instituting treatment for an ulcer a surgeon should invariably determine the variety and condition of the ulcer. Remedies which are valuable in one condition may be harmful in another. It is not enough to say that certain remedies are to be used in the treatment of ulcer; we must say what is the kind of ulcer, and what the stage of ulceration, and what the complications. In describing an ulcer give the supposed cause, the situation, the duration, the degree of acuteness, the number of ulcers, the state of the floor, the base, and edges, the discharge, and the condition of surrounding parts.]

Auger[2] applies olive oil in the treatment of **bruises.** He applies the oil with great freedom and rubs it in with fingers, and covers the bruised area with materials saturated with it. He maintains that this treatment immediately relieves the pain and enables superficial wounds to heal rapidly. [Centuries ago inunctions of oil were used for treating bruises. The oil permits of easy and gentle massage, and the massage rather than the oil is the therapeutic agent.]

Broadnax[3] advises treating **burns** by the application of **pure phenol.** Pain instantly ceases, and the only dressing necessary is lint or cotton and a bandage. [This treatment seems heroic and unnecessarily severe. We may get excellent results by milder methods. Phenol might cause gangrene. For 4 years past in the out-patient surgical department of Jefferson Hospital many burns have been treated with normal salt-solution. The plan has given great satisfaction. The solution allays the pain quickly and certainly, and greatly aids rapid granulation. The part is wrapped in cotton soaked in normal salt-solution, a bandage is applied, a trapdoor is cut in the bandage to permit of frequent additions of the solution, and the burnt region is as far as possible put at rest. If skin-grafting becomes necessary, we find the raw surface well prepared for the reception of grafts. We commend this plan to the attention of the profession.]

Leistikow[4] is a strong advocate of the use of **ichthyol in burns.** In

[1] Therap. Gaz., Nov. 15, 1895.
[2] Semaine méd., 1895, xv. p. cxcviii.
[3] Quoted in Physician and Surgeon, Apr., 1896.
[4] Semaine méd., 1895, xv. p. 487.

burns of the first degree he uses a mixture of 5 parts of zinc oxide, 10 parts of carbonated magnesium, and from 1 to 2 parts of ichthyol. In burns of the second degree he applies the following composition: 5 parts of zinc oxid; 10 of prepared chalk; 10 of starch; 10 of linseed oil; 10 of lime-water; and from 1 to 3 of ichthyol. This material is applied once daily. When there is a great deal of inflammation in the burn these two preparations can be used at the same time, the burn being first dusted with the powder, and the paste being laid on over this.

Poggi[1] treats a burn by the **application of potash** in the form of baths or lotions or compresses steeped in a saturated solution of this material. Potassium nitrate in water is a refrigerant and rapidly abolishes the pain of the burn. Such a bath applied for 2 or 3 hours frequently permanently dispels the pain. The application of compresses saturated in this solution acts in the same manner. [A trial of this method shows that it possesses considerable power in relieving pain, but not more than the method by salt-solution. A 2% solution of cocain quickly dispels the intense early pain of a burn, and Schleich's fluid does so too. An excellent drug with which to treat burns is a solution of citrate of lime, originally suggested to us by Johnston. It relieves pain and favors granulation. We have used it in a number of cases. The antiseptic treatment of burns gives excellent results, but its application causes considerable pain—so much, in fact, that it may be necessary to give an anesthetic to put on the first dressing. (See *Year-Book* for 1896.)]

The following **ointment for burns** is recommended by Dr. Haas:[2] from 75 to 150 gr. of aristol, 300 of olive oil, and 600 each of lanolin and vaselin. [If an ointment is used, the old-fashioned zinc ointment is very soothing. The trouble with its use is that suppuration arises, crusts form, and the detachment of the crusts during dressing causes much pain. The best way to remove such crusts is to soften them by the use of a spray of hydrogen peroxid projected from an atomizer. Ordinary white-lead paint was a favorite application of the elder Gross. Cosmolin should not be applied to burns of the face, because it may give rise to pigmentation.]

Picric acid for burns was originally recommended by Thierry.[3] It is said to cause immediate cessation of the pain. The remedy is not toxic, and the yellow stains produced by it may be easily removed with boric acid.

Fenwick and Barnard[4] consider **burns in children.** The plan of treatment pursued in the London Hospital is as follows: When the child is brought in severely burned it is wrapped in a blanket without having its clothes removed. Hot-water bottles are applied, and tincture of opium and brandy are given and repeated if necessary. When the patient reacts, one part after another is exposed and dressed with zinc ointment and cotton wool, and as soon as it is once more dressed it is covered with a blanket. In about 4 days suppuration again commences, and the dressings are at that time changed. Opium and brandy are given as necessary during the treatment of the case to

[1] N. Am. Pract., May, 1896.
[2] Allg. med. Central. Zeit., No. 72.
[3] Chem. and Drug., Nov., 1895.
[4] Brit. Med. Jour., Dec. 7, 1895.

allay pain. Diarrhœa must be treated the minute it arises. The prescription they prefer consists of 10 gr. of bismuth carbonate, 3 minims of the wine of ipecac, 3 of the tincture of opium, 15 of the tincture of mucilage, and 2 drams of distilled water, repeated every 4 hours.

Coombs[1] discusses the proper method to treat **powder-burns.** He says that in a few days suppuration occurs, and at this time a poultice is applied for a half hour or longer, and then a sharp razor is passed over the surface, which cuts off the soft elevations which contain the powder. The burn is then washed off with a stiff sponge, and the remaining grains of powder are caught in the meshes. The latter is cleaned and the wiping and mopping repeated until the coloring matter is absorbed by the sponge. In order to prevent subsequent cicatrization-marks as much as possible, a constant dressing of glycerol and water or glycerol of starch is recommended.

Reclus[2] presents the conservative treatment in **crushes of the limbs.** He thinks that this is preferable to amputation, no matter how extensive the traumatism may be. He wraps the crushed limb in antiseptic substances, and leaves the dead tissue to be separated from the living by natural processes, and he only makes incision in the bone when the time comes and at the proper point. This method greatly reduces the mortality from these injuries, which is excessively high when amputation is done for traumatism. He states that 2 cases out of 4 would unquestionably have perished had he amputated at the hip-joint or amputated both legs at the time he first saw them; and the results of the treatment are that the patient whose hip would have been disarticulated retained the thigh, and the patient whose lower extremities would have been amputated at the thigh retained one-half of both legs, so that he can readily apply prosthetic apparatus.

In another case in which if he had followed old rules both legs would have been sacrificed the patient recovered, and did not even lose his feet. The method is as follows: The hair is shaved from the limb; the skin is carefully cleansed with soap and water, ether, potassium permanganate, and alcohol. The edges of the wounds are thoroughly explored, so as to open up all passages and pockets, and these pockets, as well as the entire wound, are irrigated with water at a temperature of 65° C. This irrigation removes clots and foreign bodies of all sorts which are adherent to the structures. The tissues should be strongly rubbed with cotton balls which are soaked in some antiseptic. When the whole region has been thoroughly asepticized strips of gauze are covered with an ointment which he advises, and these strips are introduced into every cavity, sinus, passageway, diverticulum, and separate part. The soft tissues are brought together around the wound, and a moist gauze bandage is applied somewhat tightly. He renews this dressing every second or third week. The ointment which he advises for embalming the injured part consists of 3 drams of salol, 3 of resorcin, 3 of antipyrin, 5 of boric acid, 15 gr. of iodoform, 6 oz. of vaseline. These ingredients are but slightly capable of absorption. The results of this treatment are extremely remarkable. Out of

[1] Chemist's Gaz., Jan., 1896.

[2] Med. Week., iii. No. 45, p. 530.

7 cases which in former times would have undergone extensive operation, 6 recovered perfectly with the whole of the crushed limb or a considerable part of it preserved. The 7th died of tetanus 25 days after the accident, so that now Reclus advises we should give with the treatment antitetanic serum.

Miles[1] furnishes notes on **skin-grafts obtained from the lower animals.** He has used dogs, rabbits, kittens, and frogs as the donors. The best results are obtained from dogs, and the least satisfactory from frogs. Young animals should always be used. The ulcer should be first made aseptic, and the granulations must be healthy, neither redundant nor edematous. The granulations are not scraped before applying the grafts. In preparing the grafts the animal is killed, the abdomen is shaved, and the entire skin is dissected up, leaving behind the subcutaneous tissue. The skin is floated out in warm boric acid, and cut in pieces varying in size according to the raw surface to be covered in (from 1 in. by $\frac{1}{2}$ in. to 6 in. by 1 in.). These pieces are firmly pressed into the granulating surfaces close into the margins, edge being against edge. Dressing of protective gauze and wool, with a splint, is then applied. This primary dressing is left undisturbed for 2 or 3 days, and then is changed with the greatest caution, and subsequently we dress every day or every second day. If the graft dies, it should be at once removed to prevent septic changes. Occasionally sloughing is observed in a graft. Pustules which appear upon a recently grafted surface ought to be punctured and covered with an antiseptic dressing; if granulations grow up through the grafts, these granulations must be spooned away. In all these cases rest is of the utmost importance. The scars obtained by this method are stronger and show less tendency to contract than those obtained by any other method. The pigment over the grafted skin rapidly disappears, and no hair, sweat, or sebaceous matter appears.

Mangoldt[2] advises **skin-grafting** by small portions **of epithelium,** which he obtains by scraping the cutaneous surface with a sharp razor held vertical. The scraping is carried on until the top of the papillæ are reached. If we are going to graft a granulating surface, this should be lightly scraped; but if we are going to graft a simple wound, the surface ought to be carefully dried. The scrapings are dusted over the surface.

Amat[3] has employed the **membrane of a hen's egg in grafting.** He advises that the membrane be taken from a fresh egg. Grafting must not be done during the existence of suppuration. The egg is broken in its center; its contents are emptied out, and the lining membrane of the shell is seized with rat-tooth forceps at the large end of the egg. This layer is cut into strips about 4 or 5 mm. in width and of the same length, and these are applied on the wound with their albuminous surface down. They are covered with tinfoil and then with gauze saturated in phenol.

Lusk[4] reports cases illustrative of the advantages of a new and original method of obtaining material for **skin-grafting.** This method consists in

[1] Edin. Med. Jour., Sept., 1895.
[2] Deutsch. med. Woch., 1895, p. 798.
[3] N. Y. Med. Jour., 1895.
[4] Jour. Am. Med. Assoc., June 20, 1896.

the formation of blisters by cantharides and by grafting portions of the elevated epidermis.

THE RÖNTGEN RAYS.

[One of the most marvellous of all recent discoveries—a discovery which is of equal importance to physical science and to surgical diagnosis, which radically overturns many preconceived and long-cherished opinions, and which opens up an infinite vista to those who dream of the future, is that of Prof. Röntgen of Würzburg. This discovery enables us to obtain pictures through hitherto opaque media. A great number of valuable articles have been contributed on this subject during the year, and every day brings forth some new fact which clears up a mooted question. The whole question is in a transition-stage, and it is possible in such a work as this to quote but a few of the important articles of the year.]

Monell[1] discusses Röntgen's contribution to surgical diagnosis. Röntgen's report, which is destined to be historical, was presented to the Physico-medical Society of Würzburg in December of 1895. Monell says that the entire report is a masterpiece of technical statement—that it is deliberate, exact, and scientific, and leaves no room whatever to doubt either the proof or the means of the discovery. A synopsis of the report is then given.

Monell considers the methods employed by Edison, Tesla, and Professor Pupin. The first instrument designed as a fluoroscope was a brass tube blackened on the inside, to one end of which was secured by nonactinic black photographic paper a circular disk of paper prepared with the double cyanide of platinum and barium. The opposite end of the tube was fitted to the eye, so that light was excluded, and directed toward the excited vacuum tube, so that the rays fell upon the fluorescent screen, which then glowed and revealed the shadows of objects between it and the Crookes tube. Magie calls a similar device of his a skiascope, and Salvioni called his a cryptoscope. Dr. Emmen invented the photoscope; Edison devised the fluoroscope in which the screen is tungstate-of-calcium crystals. Prof. Röntgen employed a fluoroscope in his own experiments. In fact, it was a fluorescing screen which led him to detect the rays. Objects which are transparent to the Röntgen rays do not present any color-phenomena corresponding to the color given by common light. This is a decided drawback. When this process is developed to the highest point, it is probable that only trained experts will be able to do the work which surgeons will require for diagnostic purposes. Monell then fully describes the methods of obtaining these pictures. Spies of Berlin was the first after Röntgen to make a picture of a man's hand in which something had caused pain for many years. The negative showed a piece of glass, which was immediately extracted. In Berlin new bone-fractures were immediately photographed, and united fractures were shown through their dressings and splints. In London a wounded sailor who had received a mysterious injury was subjected to the process, and a small knife blade was found imbedded in the spine, having pro-

[1] Brooklyn Med. Jour., May, 1896.

duced paralysis. Neusser of Vienna obtained pictures of gall-stones from one patient and a bladder-calculus from another patient. The printed proofs of pictures or the half-tone reproductions are but poor representations of the real aid to diagnosis of this new process. All prints from negatives are unsatisfactory. It is the negative alone which presents the delicate shade and the even outlines which are necessary for distinctness. Nothing but the properly developed negative is suitable for a surgeon's examination. Consideration is then given to some of Tesla's remarkable work. He asks, in conclusion: "What are the actual facts to be observed in Röntgen's pictures?" We can detect presence, shape, outline, and size of bodies through the living tissues. We can locate bony or metallic material, but can only outline soft parts and masses of muscle. We cannot determine consistence, color, substance, structure, or condition; we can outline the thoracic cavity or the gastric wall, but we cannot tell whether the lungs or the mucous membrane of the stomach are normal or inflamed. A pus-cavity may prove to be more opaque to the rays than healthy tissues; so may a cirrhotic liver, a malignant tumor, or a gravid womb. The difference between fibrous and bony ankylosis, fracture and dislocation, will be certainly shown, but there is no reason to doubt that wonderful progress will take place in the future, and it seems probable that at some day we shall observe with the eye even the circulation of the blood.

The first successful modification of the action of the rays, so that varying density of tissues will lend themselves to the process of the new art, will bring all morbid growths of vital organs, of injuries, of deformities, even the vermiform appendix, within the visual and photographic field, but for the present we must pause. Improved methods must come before further advance, and for them we must look to the physicist and the photographic expert.

Fowler[1] in a preliminary note upon the possibilities of the application of photography of unseen substances to surgical diagnosis says that it would seem that the surgery of the bony structures of the body, as well as that of foreign bodies imbedded in the soft parts, has received a fresh impetus in the shape of improved methods of diagnosis. He thinks that it will be of great value in obscure cases of fracture, in cases in which, owing to excessive swelling of the parts, an accurate estimate of the exact relations of bony fragments to each other is impossible by the ordinary diagnostic methods. It enables us to be sure that efficient reduction has taken place, and obtains a trustworthy record of the conditions present which may be used for subsequent study and as a means of defence in cases of alleged malpractice. It will enable us to study the changes which the tarsal bones undergo in the course of treatment of cases of congenital varus by manipulation and orthopedic appliances. Foreign bodies imbedded in the soft tissues can be located with certainty, save in the case of gunshot injury to the contents of the cranial cavity and when bullets are imbedded in the substance of the bones.

Keen,[2] Magie, and Davis made some experiments to determine the value of the Röntgen process in surgical diagnosis. They examined a number of

[1] Brooklyn Med. Jour., Mar., 1896.

[2] Am. Jour. Med. Sci., Mar., 1896.

surgical cases: 1. A burned hand with ankylosis of the fingers at the knuckle-joints and some necrosis of the metacarpal bones. The skiagraph showed the bones in the fingers. The bones of the metacarpus were shown to be completely soldered together in one mass. 2. A tubercular elbow-joint in which not only the humerus, but the radius and ulna, were shown. 3. The elbow-joint of a man who had sustained, 12 years before, an intercondyloid fracture. The picture showed excellently the condition. 4. An elbow which had been resected a few days before. The arm was dressed in plaster of Paris with a trapdoor over the joint. The skiagraph showed that the plaster was opaque to the rays, but the gauze dressing and bandage about the elbow were translucent to them. The ends of the resected bones of the forearm showed faintly, and the end of the humerus also. 5. Shoulder-joint with a recent resection of 3 inches of the humerus. The picture was taken without removing the bandage and dressing, but the skiagraph showed only the outline of the edge of the scapula. The constant respiratory movement was a difficulty which tended to blur the outline. 6. Attempts to skiagraph the trephine-opening of a case operated upon 4 years ago were a failure. 7. A needle thrust into the hand of a cadaver. Experiments do not indicate that the hand of a living person acts differently to the rays than the hand of a dead person. 8. Exposure of various bacteria to the rays seemed to be without effect.

These records, taken with various other reports which have been made, show that the thinner portions of the body may be accurately skiagraphed. This is true of parts as thick as the ordinary elbow. Whether it is true of the thicker parts, as the shoulder and trunk, is doubtful with present methods. One of the difficulties has been the length of time necessary to take the pictures, the shortest exposure having been 20 minutes. The normal structures of the body are all permeable to the rays except the bones, and therefore it is not probable with present methods that we can determine much about these normal structures, although the British Medical Journal for the 8th of February, 1896, states that Adolph and Lenz have been able to get pictures of connective tissue. The bones are opaque to the rays; hence the deformities, injuries, and diseases of bone will be more or less amenable to diagnosis. An excellent illustration of this is a case recently quoted in the British Medical Journal, in which the distal phalanx of the great toe appeared to be double, as though there were two bones in the last joint. It was difficult to tell which of the two bones was the normal and which the supernumerary. Mosetig took a skiagraph, and was able instantly to determine. We shall probably be able, even possibly in the thicker parts of the body, to differentiate fracture and dislocation. This may be of much use in obscure cases with great swelling, for the swelling is permeable to the rays. Suspected green-stick fracture may be made evident, and in any case in which possibly a claim for malpractice would be made if, after the bones are adjusted, they are skiagraphed through the dressings, such a skiagraph might be of great value in court. Exostoses and bony tumors of any kind may be diagnosticated, but cartilage is translucent to the rays. Gall-stones have been skiagraphed outside of the

body, but not yet in the living body. Phosphatic and probably other urinary calculi are impermeable to the Röntgen rays, but it is very doubtful whether we shall be able to diagnose these conditions by the rays, because the bladder lies in the pelvic basin and the bones would cut off the rays. The kidneys cannot be skiagraphed, as that part of the body is too thick, and renal calculi are as yet beyond diagnosis by this method. It is doubtful whether the diagnosis of tumors will be much aided, except in the case of bony tumors. Other tumors seem to be as translucent as the soft parts of the body. This method is absolutely useless in diagnosticating tumors of the brain. The most important use of the method is in the location of foreign bodies. Some metals are translucent to the rays; others, and, fortunately, the common ones, are not translucent. We can find a needle which is suspected to be lodged in any part of the hand; buckshot, bullets, and glass.

The case of a young colored woman is then related who had 3 months before suffered amputation of the 3d finger. The stump was extremely sensitive. A skiagraph showed a slight enlargement of the tissues next the bone. In view of the fact that no one point at the end of the stump was demonstrated to be in a condition capable of cure by operation, the patient was advised to have the metacarpal bone removed.

Carless[1] reviews the **surgical aspects of the new photography,** and says that we are at the beginning of a new chapter. He describes in brief the method of taking these pictures. He tells us that the electrical current employed was from a battery of six Grove cells, giving a current of about 10 volts, which was passed through a Rühmkorff's coil, and this multiplied so as to reach a sufficiently high voltage to give a 3- or 4-inch spark.

Mr. Carless then considers the already very extensive literature on the subject, and says that there is great difficulty in gauging the value of the work, owing to the imperfect records that are given as to the length of exposure and as to whether the pictures came from the living subject or the cadaver. Many highly eulogistic reports should be received with considerable skepticism. The question as to the relative transparency of the tissues has attracted much consideration. Bergonié[2] and Reid[3] have considered this question. The former ascertained that the relative transparency of all the soft parts is practically identical, and that cartilage is the most transparent of all the tissues. The latter observer confirms this statement, and says that fat comes next to cartilage in transparency, that the cortex of the kidneys is more permeable than the pyramids, that in the brain the white matter allowed the rays to pass more readily than the gray, and that cancerous tissue is just as transparent as the normal tissue in which it lies. Bergonié shows that foreign bodies, especially those made of metal, with the exception of aluminum, can be readily detected under certain favorable conditions. The actual thickness of the interposed tissue must not be too great. It is probably impossible to detect a ball in the liver or lung, because the tissue thickness is too great and portions of bony

[1] Practitioner, Mar., 1896. [2] Jour. de Méd. de Bordeaux, Feb. 9, 1896.
[3] Brit. Med. Jour., Feb. 15, 1896.

skeleton are in the way. The optical laws governing the formation of the umbra and penumbra are such that if the foreign body is placed at too great a distance from the source of actinic energy, and it is impossible to concentrate this energy, then a vague and confused shadow is the best that can be expected. He showed that the sharp outlines of a needle are lost if it is imbedded in the hand at a greater depth than 1½ cm.

Neusser[1] has found that vesical calculi are opaque, and expresses the hope that we may obtain diagnostic aid in liver and bladder troubles. In injected parts of the dead body the blood-vessels are reproduced with clearness.

Lannelongue[2] has 3 interesting skiagraphs. The first is an anatomical preparation, a femur attacked by acute osteomyelitis. Certain white spots appear in the midst of the shadow, and thus the fact once more is demonstrated that this disease starts centrally in the medulla and not in the periosteum. The second picture was a finger with tubercular dactylitis; the first phalanx was enlarged and the periosteum evidently infiltrated. The second phalanx was more transparent than normal, indicating commencing osteitis.

Mosetig[3] has skiagraphed 2 cases. One was a hand in which a bullet was imbedded, the site of which could not be detected by touch. The second was a photograph of an enlarged great toe of a girl, in which it was proved that the trouble was due to the presence of an accessory terminal phalanx.

Jastrowritz[4] relates a case in which the rays enabled him to locate a splinter of glass in the hand. Petersen[5] gives 5 illustrations. One was the forearm of a corpse which was preserved in formalin, and in which fracture of the radius and ulna had been produced. The fracture is seen with tolerable clearness. There has also been an attempt to portray the tibia and fibula, but with very little success. Bar[6] has published a series of 9 illustrations, chiefly taken from infants or portions of the infant cadaver. Other cases have been mentioned in papers both lay and scientific, but he has found no accurate records of them. It is stated that Prof. Kocher has found and removed a needle in a child's hand—that a similar case occurred at St. Thomas's Hospital, and again at Leeds.

In conclusion, Mr. Carless asks what is the value of the Röntgen process from a surgical standpoint. We must remember that it is in its earliest infancy, and that we can speak of it only in the most guarded fashion. If the intensity of the rays can be increased, or if means are found to affect their reflection or refraction, then we may have to reconsider our verdict, but as things are at present there is little doubt that the part played by it will not be one of great importance. Obscure injuries and conditions of the fingers and toes will be early recognized, and it will be useful in solving diagnostic questions in these regions, although even here the majority of them will be recognized just as easily by the educated touch of the skilled surgeon. Injuries and diseases of the wrist will be little helped by the process, except in young

[1] Münch. med. Woch., Feb. 4, 1896.
[2] Union méd., Feb. 1, 1896.
[3] Presse med., Feb. 8, 1896.
[4] Deutsch. med. Woch., Jan. 30, 1896.
[5] Münch. med. Woch., Feb. 11, 1896.
[6] Presse méd., Feb. 12, 1896.

PLATE 1.



1



2

FIG. 1.—Showing result in a case of metatarsalgia after excision of the fourth metatarsophalangeal joint. FIG. 2.—Distortion of foot, showing deviation of phalanges; crowding of the third and fifth metatarsal bones upon the head of the fourth. (Morton, in Int. Med. Mag., June, 1896.)

children, where the bones are still partly cartilaginous, while the majority of such conditions as could be portrayed in the upper and more bulky parts of the adult arm and leg can usually be readily recognized without any such help. There is some ground for hoping that assistance may be derived from the transparency of tubercular tissue in the diagnosis and localization of isolated foci in the bones of children. Cancerous and other tumors are transparent to the rays unless bony tissue is present, and it is possible that a malignant tumor of bone might receive confirmatory evidence of its existence by this process. Transparency of cartilage leads us to expect that assistance will be obtained in diagnosticating separated epiphyses and fractures implicating the joints of children. Conditions within the abdomen and chest cannot be investigated by this method because of the thickness of the parts.

Burry[1] discusses the **Röntgen or *x*-rays,** gives a history of their discovery, explains what is known about them, and gives the history of an interesting case.

King[2] had 1 case in which **a speck of steel broken off from a needle** was detected in the finger. He has succeeded in making a skiagraph of a 3-months' fetus, which rather clearly defines the center of ossification, and shows how clearly at this age the bone restrains the rays, while the cartilage allows them to pass freely; also one of a wrist on which an excision has been performed, which gives a clear outline.

Morton[3] shows the value of the *x*-rays in diagnosticating Morton's **painful affection of the foot, or metatarsalgia.** The real pathology of this disease was uncertain. Morton maintained that the 4th toe was the almost invariable seat of origin of the trouble, because of anatomic reasons. There is very slight motion in the first 3 metatarsal bones; the 4th has greater mobility, and the 5th more than the 4th. Lateral pressure brings the head of the 5th metatarsal into direct contact with the head and neck of the 4th metatarsal, and to some extent the extremity of the 5th metatarsal rolls above or under the 4th metatarsal, and thus by pressing upon nerves induces neuralgia. This supposed pathology is amply proved by the skiagraphs which are herewith given (see Plate 1).

Marsh[4] reports a case in which a man when riding a horse had the horse fall and roll over him. The left arm was enormously swollen, and it was not possible to give a precise opinion. The Röntgen photograph clearly showed dislocation backward at the elbow-joint, which injury was uncomplicated by a fracture.

Smith[5] speaks of the detection of **spinal caries** by the Röntgen process. He reports a case in which he was uncertain as to the exact diagnosis. A skiagraph proved the absence of tubercular disease, as the shadows produced by the cervical and upper dorsal vertebræ were quite regular, and there were no signs of roughness of bone nor indication of an abscess. In the 2d case

[1] Chicago Med. Recorder, Mar., 1896.
[2] Canad. Pract., Apr., 1896.
[3] Internat. Med. Mag., June, 1896.
[4] Brit. Med. Jour., May 30, 1896.
[5] Ibid., June 6, 1896.

he thought that caries of the cervical vertebræ existed, and he had it skiagraphed. The skiagraph showed from the 2d to the 7th cervical vertebra. The intervertebral spaces between the 4th and 5th, the 5th and 6th, and the 6th and 7th were distinguished by light shading, but above the 4th there seemed to be a mass of bone and no sign of cartilage. The appearance of the bone showed the severity of the disease and the amount of repair, and the value of the examination could not be overestimated. It cleared up all doubts as to the nature of the case and indicated the line for future treatment. It is in the neck that this diagnostic process must be most applicable, for, except in very young children, the obstruction caused by the sternum and other dense tissues interferes with a satisfactory shadow.

Morton[1] demonstrated a needle in the foot. Battle[2] showed a needle extracted from the hand by the assistance of the Röntgen rays. M'Causland[3] showed a case of a needle which was found by the use of the Röntgen rays in the palm of the hand. Jones[4] reports a case in which a bullet lost in the wrist was discovered by means of the Röntgen rays.

White[5] reported a case of **a jack-stone** caught in the œsophagus of an infant, discovered by the *x*-rays. White tells us that in Poulet's work upon foreign bodies over 1000 cases of foreign bodies in the œsophagus are studied, but the list of nearly 100 different obstructing articles does not include a jack-stone. In this case the skiagraph was taken 13 days after the accident. The child's arms were held up, the plate was fastened to the back, and an exposure of 3 minutes was employed by Goodspeed. The jack-stone was distinctly visible in the negative, and was seen to be a little to the left of the middle line, on a level with the space between the 2d and 3d dorsal spines, a little above the bifurcation of the trachea. Attempts to reach the foreign body with forceps failed. Gastrotomy was performed. A flexible œsophageal bougie carrying a stout silk thread was then passed into the stomach from the mouth. Pieces of gauze of various sizes were knotted to the thread at various points, and the thread was moved up and down. The stone was dislodged and was brought into the stomach and removed. The wounds in the stomach and abdominal wall were closed, and the patient recovered rapidly. [This is a brilliant case. Strange to say, a few weeks after this operation, Dr. Alfred C. Wood, one of Dr. White's assistants, had an identical case, which, by the same plan, was conducted to a successful conclusion.]

Turner[6] has discussed this new process, and has reported cases in which foreign bodies were found—cases of bone surgery and applications of the method to teaching. One case was a woman who had a needle in her hand which was detected by these rays (Figs. 79, 80). Another case was a woman who had run a needle into her foot. The fluoroscope showed that the needle, between $\frac{1}{4}$ and $\frac{1}{2}$ in. long, was present, and exploratory incision failed to find it. The wound was sewed up and rephotographed. The picture again showed

[1] Med. Rec., Mar. 14, 1896.
[2] Lancet, Feb. 29, 1896.
[3] Dublin J. M. Sci., May, 1896.
[4] Lancet, Feb. 22, 1896.
[5] Univ. Med. Mag., Sept., 1896.
[6] Lancet, June 20, 1896.

the needle. Experiments were conducted with a skeleton foot on the screen, and the same shadows were found to be produced by a needle lying in the sheath of the peroneus longus; so the wound was opened and the sheath and tendon carefully explored, but no trace of the needle was found. The foot was then skiagraphed in 4 different positions with a guide-needle placed in the

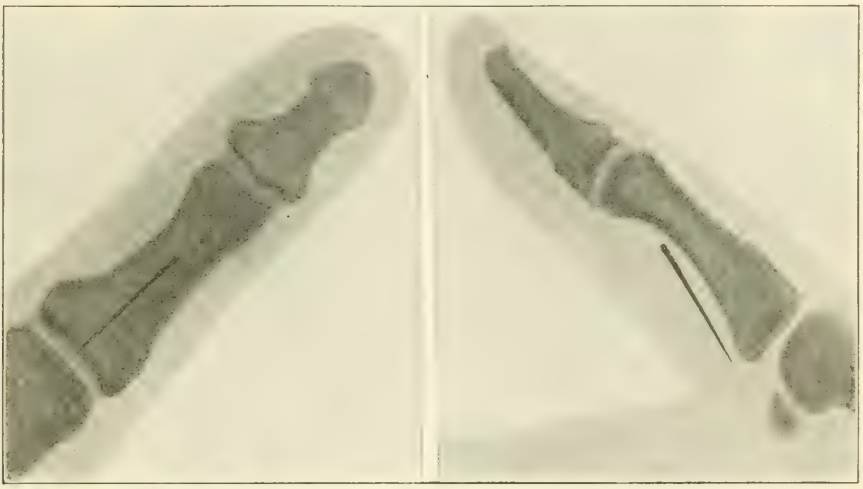


FIG. 79.—Needle shown through the phalanx; the palmar surface of the thumb was on the plate (Turner, in Lancet, June 20, 1896).

FIG. 80.—Side view of thumb; the hand was pronated, so that the radial surface was on the plate (Turner, in Lancet, June 20, 1896).

wound, and the relationship of the 2 thus determined, and a third operation was undertaken, but was equally unsuccessful. A skiagraph taken after the wound healed distinctly revealed the needle in the same position. This case shows very clearly the great difficulty which may be experienced in removing a foreign body when one has only the shadow to work from.

Turner says that the application to general bone-surgery is not chiefly from a diagnostic point of view. He has not skiagraphed a single case where the diagnosis was materially altered, but he has several times confirmed a diagnosis and found out the exact extent of an injury. It is very valuable in fractures to ascertain the extent of injuries, especially the amount of comminution and longitudinal splitting of the bone. He took a skiagraph in the ward without disturbing the patient, the splints and dressings being untouched; extension from the leg was not even removed. He relates the case of a man who had a compound comminuted fracture of the tibia and fibula and a simple fracture of the femur of the same side. The lower fractures were explored, some loose portions of bone removed, and a wire placed through the tibia. A skiagraph taken 5 weeks after the accident showed longitudinal splitting of both bones with a large amount of comminution, and also shows that the early callus is very transparent to these rays and does not show. A skiagraph of the femur with an $8\frac{1}{2}$-minute exposure shows impaction at the shaft of the bone at the junction of its upper and middle thirds, the upper part being split into two pieces, enclosing the conical-shaped upper end of the lower fragment. Cases can be

skiagraphed through water-glasses, allowing the surgeon to watch the progress of the case. Figure 81 shows the case of a man who broke his right radius. Eleven months later, the fracture being ununited, a piece was taken out of the ulna and both bones were wired. The illustration showed that osseous union

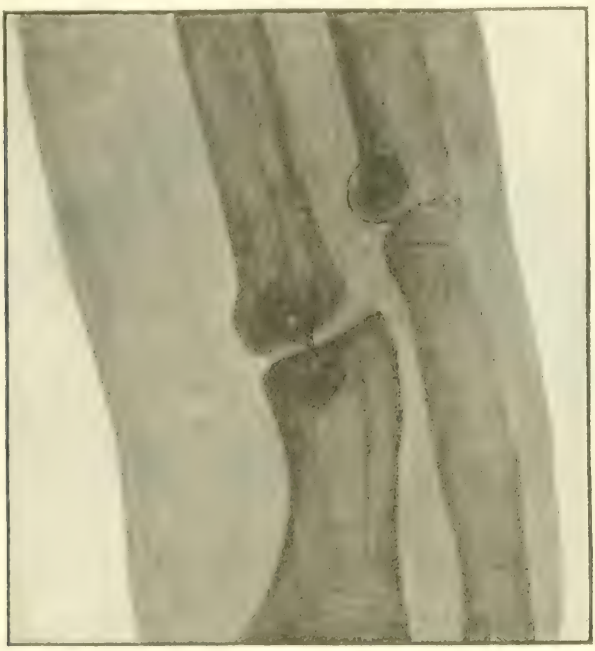


Fig. 81.—Reproduction of photograph of fractured radius and ulna, showing no union and wires which had been put in; exposure six and a half minutes (Turner, in Lancet, June 27, 1896).

had not as yet taken place. This process is valuable in injuries about the elbow-joint. In deformities it may also be found useful—for instance, in exactly locating the position of the curve of the femur and the absence or presence of a metatarsal or metacarpal bone.

Turner thinks that the Röntgen process can be used with the utmost benefit in teaching students osteology, showing the method of the growth of bones, with the epiphyses, their positions, their appearance at different ages, their date of union, and the diaphysis. It can be used in teaching surgery. The skiagraph of the knee-joint which he has taken would enable the teacher to point out to the student the importance of remembering the position of the epiphysis, and the line of cartilage from which the bones grow when excision is about to be performed, and to emphasize the importance of not injuring the cartilage. The skiagraph of the two wrists of a patient (Fig. 82) shows clearly to the student their position and differences taken in the dorsopalmar position with an exposure of 4 minutes, and the fellows of them taken in the radioulnar position with 6 minutes' exposure, demonstrating to the student (*a*) the position of a Colles fracture, (*b*) the clinical evidences of it, and (*c*) the causation of the deformity. The position of the corresponding styloid pro-

cess is rendered clear, the prominence on the dorsal surface being produced by the backward and upward displacement of the lower fragment, that on the palmar surface being due to the projection of the lower end of the upper fragment. The rotation of the lower fragment on its anteroposterior axis, the consequent abduction of the hand and prominence of the styloid process of

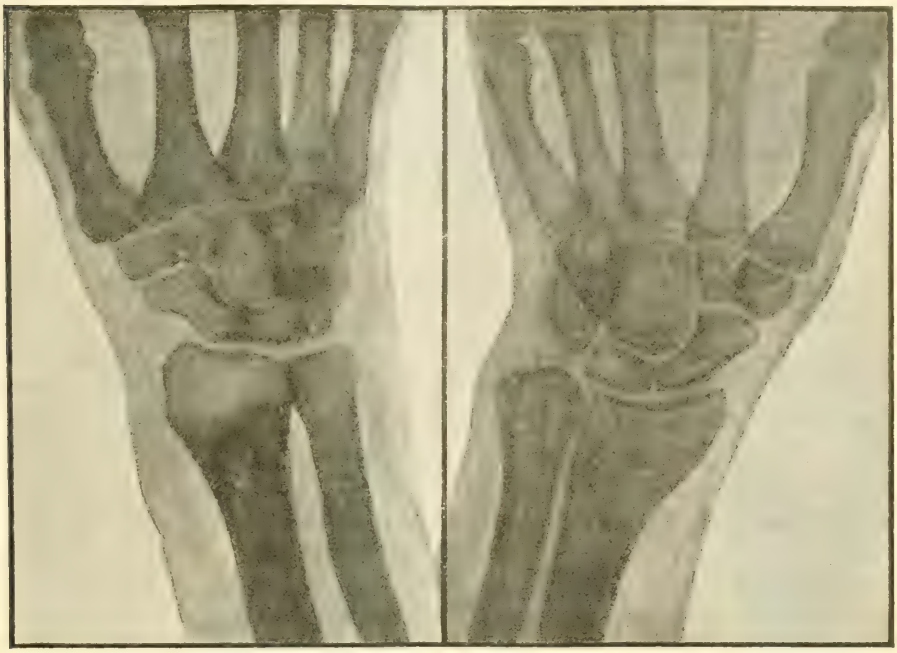


FIG. 82.—1, skiagraph of a Colles' fracture: the line of fracture appears across the lower end of the radius; 2, a normal wrist-joint, for comparison with preceding illustration (Turner, in Lancet, June 27, 1896).

the ulna, and the rotation of the lower fragment on its transverse axis, with resulting extension of the hand at the wrist-joint, are also shown.

MILITARY SURGERY.

Conservative Surgery on the Battle-field and First Aid to the Wounded.—Under this title Senn[1] says: Conservatism will be a characteristic of the coming days of military surgery. The two great dangers, hemorrhage and infection, will be enormously diminished. Mutilating primary operations will be limited to injuries which extensively destroy the soft parts, and complications of large vessels and nerves which are in themselves severe enough to arrest nutrition in a limb. Gunshot injuries of bones and joints will no longer render primary resection or amputation imperatively necessary, and the danger of wounds which penetrate cavities will be greatly lessened. Prompt and efficient aid to the injured is the first essential of battle-field surgery, and it can be achieved only by means of a well-trained hospital corps, and it must be entrusted largely to the educated noncombatant soldier.

[1] Jour. Am. Med. Assoc., July 6, 1895.

Temporary Hemostasis.—A large percentage of battle-field deaths have always been due to hemorrhage. The use of the modern small bullet, which travels with great velocity and has a high penetrating power, will render deaths from acute primary hemorrhage more frequent. The modern bullet inflicts a sort of incised wound; the round or large conical bullet causes a contused wound. Wounds from the older-style projectiles were frequently followed by sloughing and secondary hemorrhage. In primary hemorrhage ligation upon the field will rarely be performed, the operation being done at the first dressing-station or field-hospital. It is rarely essential to distinguish between venous and arterial bleeding, in order to effect a temporary arrest. The means used to temporarily arrest bleeding are—1. *Elevation of Limb.*—It can be effected as is shown in Figures 83 and 84. 2. *Digital Compression.*



FIG. 83.—Elevation of the upper extremity in the treatment of hemorrhage (Senn, in Jour. Am. Med. Assoc., July 6, 1895).



FIG. 84.—Gun-stack for elevation of the lower extremity (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

—This is continued until the ligation of the vessel or until the application of an elastic band or an antiseptic tampon. 3. *Forced Flexion.*—Forced flexion of the forearm can be made by a handkerchief. Forced flexion of knee is obtained by passing a bandage, suspender, gun-strap, or belt through a slit in the shoe above the heel, tying the ends over the thigh, and fastening it with a safety-pin (Figs. 85 and 86). 4. *Elastic constriction* is safe and certain. The limb is elevated for a few moments, and Von Esmarch's band or a suspender is applied above the wound. In order to prevent injurious compression upon nerves, try and apply the band at a point where the main nerves are

well protected by muscles (for the arm constrict around the middle of the deltoid or over the top of the shoulder; for the thigh, near its base). It is entirely safe to maintain elastic constriction for from 4 to 6 hours, but it would be unwise to continue it longer. 5. *Antiseptic Tampon.*—Every soldier



FIG. 85.—Genuflexion in the treatment of hemorrhage from the popliteal artery and its branches (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

carries an antiseptic package. The wound is dusted with antiseptic powder, a graduated compress is made, and its apex is brought in contact with the bleeding vessel, and pressure is made by a bandage. This method is of great value

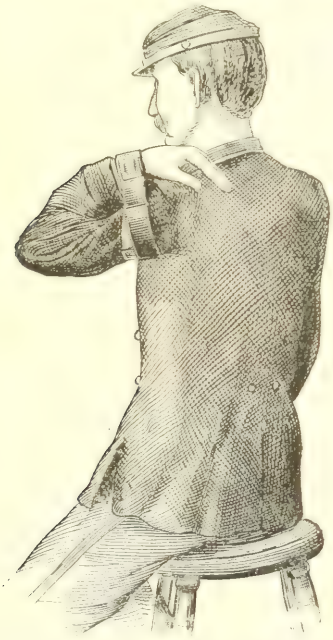


FIG. 86.—Forced flexion of forearm in arresting hemorrhage from the brachial artery opposite the elbow-joint or any of its branches below this point (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

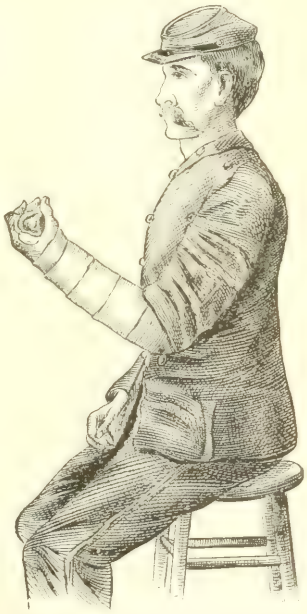


FIG. 87.—Antiseptic tamponade of wound of deep palmar arch (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

in injuries of face, scalp, and intercostal spaces, in lacerated wounds and sabre wounds, and often arrests bleeding permanently (Figs. 87, 88).

Internal Hemorrhage.—The opening of the cavity which contains the

bleeding vessel will be done at the first dressing-station. What can be done upon the field of battle: In bleeding from intracranial vessels due to bullet-wound, do *not* plug, as the accumulating blood would cause death by cerebral compression. Insert into the track of the projectile a strip of aseptic or of iodoform-gauze. This gauze-drain prevents disastrous pressure, and tends to check bleeding by being in contact with the vessel. Secure the drain to the wound-surface by a safety-pin, and dress the wound antiseptically. In bullet wounds and stab wounds of the chest use the antiseptic tampon and apply circular compression of the chest by means of a bandage. The cartridge-belt or gun-strap may be used to limit respiratory movements (Fig. 88).

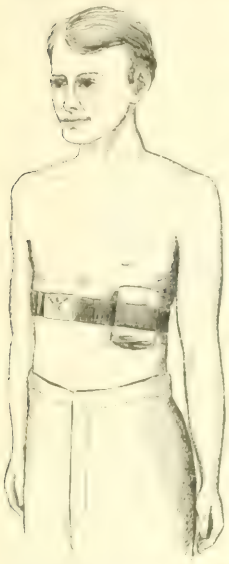


FIG. 88.—Treatment of penetrating wound of chest by antiseptic tamponage and immobilization by circular compression (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

In abdominal wounds in which the source of bleeding is below the bifurcation of the aorta apply compression to the aorta (Fig. 89). In other cases put gauze over wound, lay a large compress over the gauze, and apply circular compression by a belt or gun-strap. The direct compression diminishes the vascularity of the underlying parts, and the circular compression limits abdominal movement.

Permanent Hemostasis.—1. *Forcipressure.*—The use of the forceps on the battle-field will be a great advance. 2. *Ligature.*—Ligation will usually be done at the first dressing-station or field-hospital. Silk should be used in military service. 3. *Vein-suture and lateral ligature* are used in small wounds of large veins and sinuses. Suture is applied like the Lembert, and either silk or catgut can be used. 4. *Hot Water and Styptics.*—Stypties are used only in



FIG. 89.—Compression of abdominal aorta (after Esmarch) (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

bleeding from mouth and pharynx where tamponade cannot be used. Hot water (120°–130°) is very valuable in parenchymatous hemorrhage. *Saline infusion* is very valuable when people are dangerously debilitated by bleeding. It restores a normal degree of intracardiac and intravascular pressure. Szumann's solution is used ($NaCl$ 6, Na_2CO_3 1, H_2O 1000). A fountain syringe is used, and the median basilic vein receives the injection. The vein is exposed, a ligature is thrown loosely around it, a glass tube is inserted toward

the body, the ligature is tightened to hold the tube in place. From 500 to 1500 grams are injected.

Autotransfusion is of service. By excluding unessential parts from the general circulation we secure for the vital parts a sufficient supply of blood. One or more of the extremities is elevated to render it bloodless, and constriction is applied high up.

Shock is often difficult to differentiate from hemorrhage. The maximum of shock is almost immediately after the accident. In hemorrhage the symptoms progressively increase. Shock must be actively treated—recumbency, active stimulation and external heat, alcohol, camphor, ammonia, amyl nitrite, strychnin. No important operation is undertaken until reaction is brought about.

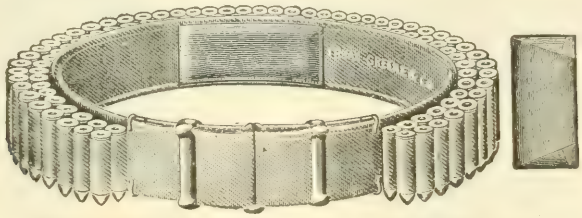


FIG. 90.—Cartridge-belt with package sewed on inner surface.

Primary dressing is applied as soon as possible. The materials are obtained from the package carried by the soldier. Esmarch thinks the package should be kept sewed into the uniform. Senn thinks it should be sewed upon the inner surface of the cartridge-belt (Fig. 90). The package should contain ½ oz. of compressed salicylated cotton and a triangular gauze bandage. In the center of the cotton is a powder (½ g. of salicylic acid and 2 g. of boracic acid). The cotton is surrounded by the gauze bandage, which has stuck in it a safety-pin, and the whole is wrapped in gutta-percha tissue. In applying the dressing the cotton is loosened, the



FIG. 91.—Primary dressings of head (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

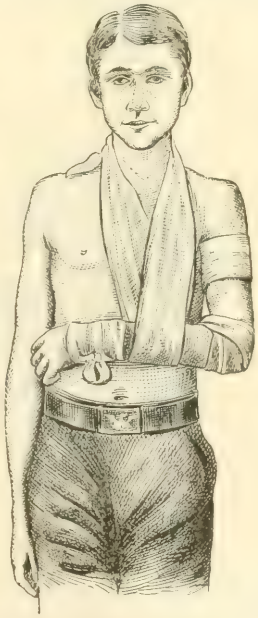


FIG. 92.—Primary dressings of upper extremities (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

wound is dusted with the powder and well covered with the cotton, and the dressing held in place by the triangular bandage and various extemporized

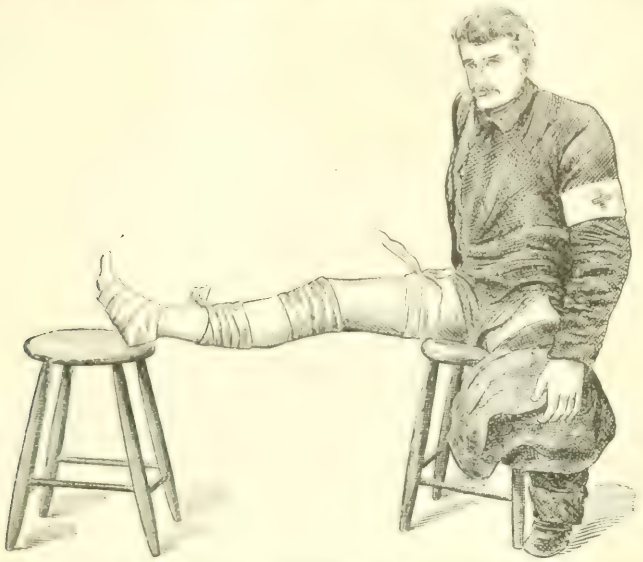


FIG. 93.—Primary dressings of lower extremities (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

appliances (see Figs. 91–93). The drying powder is a very important addition, because the dressings soon saturate with blood and the powder prevents the blood from decomposing.



FIG. 94.—Immobilization of arm and forearm by fastening the sleeve to the coat near the wrist- and elbow-joints with safety-pins and inserting hand underneath coat on opposite side between two buttons (Senn, in Jour. Am. Med. Assoc., July 6, 1895).



FIG. 95.—Mitella by fastening lapel of coat on injured side with two safety-pins in such a position as to support the forearm in a flexed position (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

Immobilization of Joints and Limbs.—This is brought about by various expedients (see Figs. 94–98).

In the Field Hospital.—It is here that hemorrhage is permanently arrested, that patients are restored from shock, that grave wounds are examined



FIG. 96.—Saber splint for leg and thigh (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

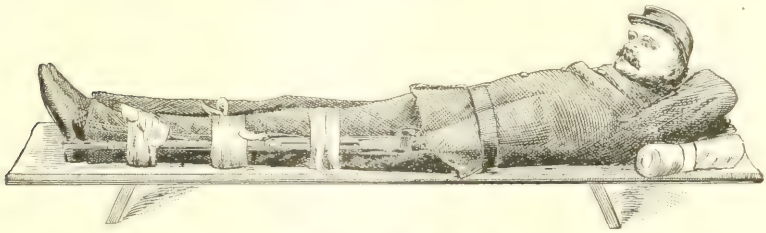


FIG. 97.—Gun splint (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

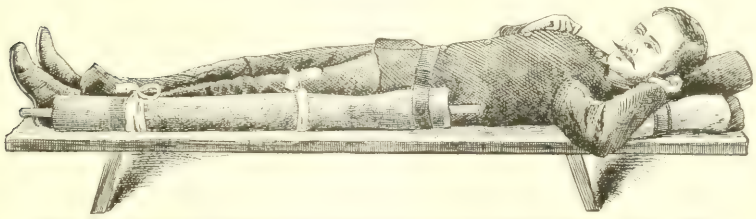


FIG. 98.—Stick and blanket splint (Senn, in Jour. Am. Med. Assoc., July 6, 1895).

and treated with antiseptic care, that the skull and abdomen are opened for penetrating wounds, and that plaster of Paris is applied instead of temporary fixation in cases of compound fracture and penetrating joint wounds.

Indications for Probing and Extracting the Ball.—The bullet-probe is rarely needed in injuries inflicted by the modern small-caliber bullet, because the great velocity and power of penetration of this projectile causes it in many cases to pass through the body regardless of resistance of bone. When a wound of exit exists, do not probe. The modern bullet is rarely altered in shape, and rarely deflected by striking bone. Search for the bullet, if undertaken, requires absolute aseptic care, and is justifiable in gunshot fractures and penetrating wounds of cranium and joints. It is absolutely contraindicated in penetrating wounds of chest and abdomen. In bullet wounds of the soft parts probing is justifiable if there is reason to think that the ball is located in an accessible place. If a bullet can only be removed by a formidable operation, let it alone and await indications. The modern bullet, like the old leaden ball, is apt to become encysted, and when encysted is harmless. The hard metal jacket of the modern projectile renders less useful the Nélaton probe and the American bullet-forceps. Nevertheless, the Nélaton probe is a good instrument to follow the track of the ball. The bulb should be longer than that usually made. It should be nearly the size of the bullet (Fig. 99). In using the probe try

to place the parts and tissues, if possible, in the position they occupied when struck. Employ no more force in using a bullet-probe than in introducing a catheter. If a bullet can be felt under the skin opposite the wound of entrance, extract it without exploring the track of the ball. If the bullet is lodged in a region in which its presence will prevent good function (as in a joint), enlarge

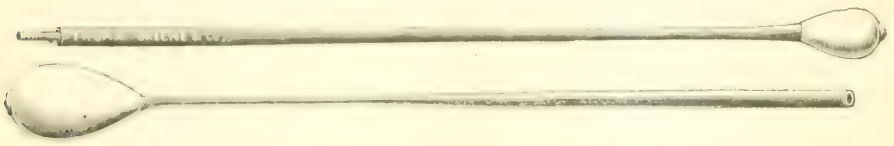


FIG. 99.—Senn's bullet probe.

the wound of entrance and remove the ball. Bullet-forceps must have great power of grasping. In gunshot wounds of the skull use Flührer's aluminum probe by his method of operating.

In every penetrating wound of the cranium, operate. We operate in order to stop bleeding, render the wound aseptic, remove bone spicules, foreign bodies, and, if possible, the bullet.

Celiotomy is advisable in penetrating wounds of abdomen. Primary amputation for gunshot wound is only justified by extensive injury of soft parts and fractures and joint-wounds complicated by injury of large vessels and nerves. In every doubtful case try to save the limb.

Primary resection of joints for gunshot wounds is obsolete in military surgery. Such joint-injuries are disinfected, the fragments of bone and foreign bodies are removed, a gauze drain is inserted, and the limb is immobilized in plaster of Paris. Many cases will be saved; none will eventually require secondary resection or amputation.

MacCormac,[1] **discussing some points of interest in connection with the surgery of war,** says: The modern rifle has produced great changes. It sends a small and hard projectile with enormous velocity to a great distance, and this projectile is a great advance not only upon the round bullet of Brown Bess, but upon the ovoid bullet of the needle gun and the cylindroconoidal bullet of the Minié rifle and the Chassepôt. The Lee-Metford rifle with white powder was used very successfully by the British in the Wazingstan expedition and in Chitral; the volleys were almost smokeless and noiseless, and were very destructive. Examples of gunshot injury from this source have not come to hand.

Fractures were shown produced by the Chassepôt and needle-gun. Some show great shattering, some guttering, some a keyhole opening with a long fissure running from it. The only chance to study the effects of the modern bullet upon the human living body is in accidents and suicides. Most of our studies are of the effects upon animals and cadavers. The study of the effect upon a dead body is not exactly representative of the effect upon a living body. Many experiments have been made at short range with small charges of pow-

[1] Brit. Med. Jour., Aug. 3, 1895.

der, the short range enabling us to certainly strike the target; but results got by this method are very different from those with full charges. During the last 20 years the caliber of the rifle and the size of the projectile have progressively diminished, while the hardness of the bullet has greatly increased.

The following table sets forth the most important particulars as to rifles and projectiles used in different countries:

Small-caliber Magazine Rifles and Bullets.

Country.	Pattern of rifle.	Year.	Caliber.		Bullet.	Length in inches of bullet.	Diameter of bullet in inches.	Weight in grains.	Muzzle velocity in foot-seconds.	Sighted to yards.	Range in yards.
			Millimeters.	Inches.							
England	Lee-Metford.	1889–91	7.7	0.303	Cupro-nickel jacket.	1.25	0.311	215 to 217	2000	2900	3500
France	Lebel.	1886	8.0	0.315	Cupro-nickel jacket.	1.26	0.322	216	2073		
Germany	88.	1888	7.9	0.311	Nickel-plated steel jacket.	1.22	0.318	227	2034	. . .	4382
Austria	Mannlicher.	1888–90	8.0	0.315	Steel jacket.	1.25	0.322	244	2034		
Roumania	Mannlicher.	1892	6.5	0.256	Steel jacket, nickel plated.	1.23	0.263	162	2395		
Russia	"3-line" pattern.	1891	7.62	0.300	Cupro-nickel jacket.	1.19	0.307	214	2034		
Spain	Mauser.	1892	7.0	0.275	Steel jacket, nickel plated.	1.19	0.284	172.8	2288	2187	
Old patterns.	French Chassepôt.	1866	. . . .	0.433	Conical soft lead.	1.00	0.463	375 to 385	1476	1094	
	Prussian needle gun	1841	13.6	. . . .	Ovoid soft lead.	1.08	0.535	478	1200		
	Brown Bess.	1800–42	. . . .	. . . .	Spherical soft lead.	. . .	0.697	488	1240	100	
	Snider.	1866–67	. . . .	0.577	Soft lead.	1.04	0.577	480	1350	1450	
	Martini-Henri.	1872	. . . .	0.45	Hardened lead.	1.27	0,45	480 to 410			

We find from this table that the modern rifle has a nearly identical caliber in each of the European armies (from 7–8 mm.), and that the weight of the projectile is nearly identical, except in Spain and Roumania (215–225 gr.). The form is an elongated cylinder with a rounded extremity, composed of a core of hardened lead and a jacket of steel, copper, nickel, or German silver. Its length is four times its width, and the rifling gives to it a rotary movement of 2500 revolutions per second and a muzzle velocity of 1800–2500 ft. per second. The English army employs a projectile which has a core of lead hardened with antimony and a jacket of nickel hardened with copper. It weighs 215 gr., and upon impact is not apt to change its shape, as was the old leaden bullet. Its small size, its hardness, its great velocity, and its penetrating power cause it to inflict remarkable wounds. The range is about 3500 yd. (over 2 miles); the trajectory is flatter, and the direction truer, because of diminished aerial resistance and greater driving power.

The amount of damage inflicted by a gunshot wound is determined by the unalterable form of the projectile, its size, its velocity on impact, and the tissue-resistance. Hitherto nine-tenths of the wounded were disabled by rifle bullets, and the perforation will not be less from the modern magazine guns, which fire 60 shots a minute and carry an immense distance.

Bruns, Delorme, Habart, and Lagarde made experiments with short ranges and reduced charges, so as to reduce velocity to about the degree that the projectiles at 100, 500, or 1000 yd. would have with full charges. Wounds inflicted in this manner are not so grave as those produced by the old leaden rifle bullet. These experiments showed that at what corresponded to short ranges (up to 400 yd.) explosive effects were produced by both the old bullet and the new, and the injuries did not materially differ. At 250–300 yd. the old bullet ceased to cause these effects; the new bullet produced them up to 350–400 yd., or even much farther. The extent of explosive effect depends upon high velocity, size and hardness of projectile, and resistance of the part impacted. Vascular tissues, organs like the liver and spleen, full stomach, brain, and full intestines suffer most from this explosive effect. We do not refer to an injury caused by an explosive bullet. The entrance wound is not peculiar, but the internal soft parts are pulpefied, and this pulpefaction extends for a considerable distance around the bullet track. The wound of exit is large and lacerated. Bone, if struck, is comminuted, powdered, and driven widely into the surrounding tissues. The wound about the bone is conical, the base at the surface, the apex at the bone.

If a bullet be fired through an empty tin box or an empty skull, both the wounds of exit and entrance correspond nearly to the size of the bullet. If a bullet be fired through a tin box filled with damp clay, water, jelly, or wet sawdust, the box bursts asunder.

Wm. Busch was the first to suggest that these effects arose from a sudden increase of hydraulic pressure. This pressure is not truly hydraulic, as it is not exerted equally in all directions, but largely in the direction in which the projectile moves. It occurs *almost* equally in closed and open vessels filled with fluid or jelly. The increase in cubical volume of the contents upon being struck is in a closed vessel nearly $\frac{1}{3}$, and in an open vessel $\frac{1}{4}$ or $\frac{1}{5}$ (as much as 300 times the bulk of the projectile). Water has an enormous resistance to a bullet. The bullet has probably traversed the part before hydraulic influence takes effect. This effect is obviously due to the retarding effect of fluid upon the flight of the projectile, the motion of the projectile being transferred to the parts immediately around, and from them to parts farther removed, as circles of waves are produced by dropping a stone into smooth water. A study of reduced charges would indicate that empty viscera and elastic lung do not suffer from explosive effects (Bruns' studies); the skull and semifluid organs show them to a fearful extent. Between 400 and 800 yd. explosive effects are only manifest upon the skull, not in other regions; between 800 and 1200 yd. explosive effects are rare, even in skull, and less destructive. At this range Bruns holds that the track in the soft parts is narrower than the bullet; the wound of exit a little larger; in expanded ends of bones no fissures or but slight fissures are formed. Beyond 1200 yd. the projectile begins to wobble, and damage becomes more extensive.

The Prussian authorities, struck with contradictory results set forth by experimenters with reduced charges, had made experiments with full charges,

and the results obtained were compared with those noted in individuals who were shot while living (suicides or accident cases), and were found to correspond.

The bodies were clothed in shirts and injected with Wickersheimer's solution (to give them proper fluidity). Two methods were employed to estimate damage: 1. Freezing and making a section of the track of the ball; 2. Making a cast in fusible metal of the interior of the wound, and thus getting a model of the destroyed area.

Nine hundred experiments do not confirm the accuracy of Bruns' claim that gunshot wounds can be classified according to range; as the range increases the extent of injury diminishes.

"It must be remembered, however, that the projectile produces different effects on different organs and different parts of the body, according to their density or fluidity, and even the same part or organ in different individuals will present differences which materially affect the extent of the damage done by bullets fired from equal distances, so that the range of fire cannot be determined with precision from the extent of the injury inflicted. Nor does the size of the entrance wound enable one to draw any definite conclusion. It is larger at short ranges than at longer ones, varying from 7.6 mm. (0.3 in.) at 100 yd. to 5.0 mm. (0.2 in.) at 2000 yd. range. When the bullet strikes perpendicularly to the surface the opening will be circular with smooth edges, which after an interval become dry and brown. If the skin be wrinkled or loose, the wound will be stellate, and when the bullet strikes obliquely or transversely, it may be large and ragged. The exit wound is larger and more variable in shape than the wound of entrance. When the projectile emerges perpendicularly to the tissues traversed, the exit wound is circular in about 20% of the injuries, while a circular shape in the wound of entrance is twice as frequent.

"The bullet in nearly every case was found to go straight through the part struck, and the old-fashioned contour shot was never met with. The human body is traversed with ease at 2000 yd., and the skull, thorax, and abdomen will suffer alike. At less than half this distance the old bullet has lost most of its momentum, and becomes flattened out or impacted when it strikes a bone without penetrating deeply.

"Portions of clothing were found in the wound in only 2 cases up to 600 m. range, but they appear to have been carried in in about 12% of the total number.

"*Wounds of Abdomen.*—In these injuries the liver showed the largest amount of damage, and in some cases of suicide large portions of it were reduced to pulp. Up to 1200 yd. the entrance wound was usually large and stellate and the exit track funnel-shaped, with lateral rents extending from it.

"In the spleen and kidneys similar injuries were produced. In the intestine each bullet produced on an average three openings, and in some cases as many as eight, and the extent of the damage seemed to bear no defined relation to the length of range. It was more extensive when the intestine was full. At the entrance wound and, to a lesser extent, at the wound of exit, the bullet caused more damage to the serous coat of the intestine than to the mucous, while in the stomach the converse obtained, and the mucous coat was more extensively injured than the serous.

"*Injury of the Head.*—Fearful destruction of skull is produced by a small 5 mm. (0.2 in.) bullet at 50 yd. range. The vault is completely shattered, the base extensively split open, and the brain destroyed. The 8 mm. bullet produces similar results, but, as a rule, the fragments hold together. At 100 yd. the entire vault is shattered, fissures extend from both entrance and exit wounds, and a gaping line of fracture was constantly found extending between them. The fissuring around the wounds of exit and entrance shows two different types—one circular, the other radiating—and the base is also traversed

by fissures. Up to 1600 yd. the fissures gradually diminish or disappear, with the exception of the one connecting the entrance and exit wounds, and sometimes a clean perforation occurs, which becomes frequent at 2000 yd. The skull when emptied of the brain shows a round keyhole perforation at all distances, but if it be filled with jelly, the amount and character of injury are the same as when it is occupied by brain-substance. The dura is lacerated to an extent corresponding to the injury to the bone. At short range the brain is pulpefied and numerous blood extravasations are found in its substance and beneath the meninges. At long range the bullet track through the brain tissue is cylindrical, the walls are moderately contused, and the caliber of the channel is always less than that of the bullet. Portions of the skull may be carried in at the entrance wound for some distance by the bullet, so that there the injury, as a rule, will be most severe.

"*Injury to the Long Bones.*—Gunshot fractures are very frequent and possess great interest. They vary according to which bone or part of the bone is struck. The effect upon the spongy extremities and upon the compact tissue is very different. From 100 to 200 yd. the shaft of the femur is broken up into small pieces for an extent of from 3 to 5 in., and the humerus from 2 to 6 in. At the entrance wound in the bone the fragments remain in part attached to the soft parts, but at the wound of exit they are completely separated. The adjacent muscles are filled with bone débris and detached fragments of bone, the muscles and tendons are torn, and the exit wound in the soft parts is large and ragged. In the spongy bones and spongy extremities of the long bones the crushing and fissuring at short range are also great, but the fissures are often concealed by untorn periosteum, and there is less damage to the soft parts at the wound of exit.

"At a range of 600 yd. there are occasionally keyhole shots, with radiating fissures in the spongy tissue, and at 800 yd. the keyhole channels become frequent, but even up to 1600 yd. or more the compact tissue is extensively fractured. At 1200 yd. the fragments of bone, as a rule, are no longer driven into the soft parts beyond, but this happens occasionally even up to 2000 yd.

"The conclusion to be drawn from the German experiments is that the damage to the shaft of a long bone is very extensive for all ranges up to 2000 yd., the main difference being that at short ranges of 200 or 300 yd., for example, the fragments are more numerous, smaller, and more stripped of periosteum, while the converse obtains at longer ranges.

"The damage done to the soft parts lying between the fractured bone and the wound of exit is enormous at short distances. Above 700 yd. the exit wound becomes smaller and the internal damage begins to diminish.

"The experiments also show that the minute external openings these bullets make often bear an inverse proportion to the amount of internal damage. Very small openings of entrance and exit are compatible with enormous destruction of the compact bone tissue traversed by the ball between. The current opinion that the new bullet causes on the whole less serious damage than the old seems scarcely well founded.[1] It was devised certainly with no humane intention, but in order to incapacitate by killing and wounding as many men as possible in the shortest possible time, and it seems admirably devised to ensure this result.

"*Deformation of the Projectile.*—The liability to change in form is a very important element in the amount of damage caused by a bullet. A leaden ball is flattened or spread out on striking a bone; it may be grooved by a tendon or fascia or split into several pieces. The amount of deformity depends on the momentum of the bullet, the result of its weight and velocity combined, as well as the resistance of the part of the body struck. The new bullet may traverse the body with little or no alteration in shape, or the resistance may be great enough to crush or split it with a corresponding increment of developed heat. The tip only may be flattened or the whole bullet converted into mushroom form, with separation of the jacket. The harder the bullet, the less, other things being alike, is the tendency to deformation and the greater the penetrating power. The total number of altered bullets amounted to 4.5%, but if only cases in which the bone is

implicated be taken, the proportion is considerably increased. In the hard bones of the horse it amounts to as much as 14%.

"Wounds involving the soft parts only never produce any alteration of shape, while the compact tissue of the long bones causes the maximum amount of deformity. The jacketed projectile passes through spongy bones and soft parts without change. Even at short ranges and after striking compact bone its tip may be only slightly flattened or bent. A portion of the jacket is sometimes stripped off, and this accident is most frequent with the nickel envelope used for the American rifle bullet, the French Lebel rifle, and in our own arm.

"It may be affirmed that the extent of the damage inflicted increases proportionately with the amount of deformation in the bullet. The separation of the jacket and dislodgement of the leaden core occasion injury which often exceeds in degree that of the old leaden bullet, and this was observed at even so long a range as 1000 yd. A bullet deformed by ricochet will also cause extensive damage, but somewhat differently, as the entrance track will be implicated, as well as the channel beyond the bone."

The penetrating power of a bullet is in proportion to the square of its striking velocity, but is also much influenced by its density, by its form, and by the unchangeability of its shape. The modern projectile is less likely than the old to lodge in the body, because of its small size, its hardness, and the velocity with which it is propelled. It nearly always passes through instead of lodging in the parts struck, and we therefore avoid much after-trouble.

Habart and Chauvel have found that up to 1500 or even 2000 yd. the hard bullet goes completely through the body, and Bruns says that the projectile never lodges up to 200 yd. Thus we see that the disastrous attempts to extract lodged bullets will in future be largely done away with. Of course there will in time of war be many irregular kinds of injury—those, for instance, which richochet shots produce, the bullet having struck the wall or the ground, and altering its shape and direction, and then being capable of inflicting terrible injury. A long range increases the liability to this occurrence. It is much less common now than in the old bullet to have pieces of clothing carried into the wound, although this still maintains in about 12% of cases. The primary hemorrhage was rarely produced by the old leaden bullet unless some very large artery was torn across; secondary hemorrhage was, however, very common.

The new projectile neither bruises an artery nor pushes it aside. There is no evidence that an artery is ever pushed aside and thus escapes injury, and, except at a very short range, the bullet never entirely divides one of considerable size. A large vessel in the course of the wound of exit is extensively lacerated after the bullet has previously passed through bone, but otherwise the wounds are incised in aspect. Frequently a part of the vessel-wall is cut as if punched out. This incomplete division renders a spontaneous arrest of hemorrhage extremely difficult, and therefore fatal primary hemorrhages will be more frequent in the future than in the past. The most important question is, how far the injuries inflicted by the new projectile will be more amenable to successful treatment. Volkmann asserted that the subcutaneous character of gunshot injuries of bones and joints made them much less dangerous than compound fractures produced by other causes. Pirogoff was astonished by the easy healing of the wounds caused by the small Circassian copper bullet.

MacCormac has received favorable accounts of the character of the wounds caused by the Lee-Metford bullet from Burden. The wounds through the soft tissues were practically incised, with very little bruising, and they quickly healed, and clean, punched-out holes with little splintering were found in the bones, and in no case was there any explosive action. It is difficult to estimate the extent of gunshot injury to the bone when it is covered by the soft parts. In future the rule of practice in gunshot wound of the diaphysis will be conservation of the limb. If the exit-wound be large and ragged and important vessels and nerves are damaged, amputation will be demanded, but this necessity will depend upon the associated injury to nerves and vessels, and not on the extent of the fracture of the bone. If the epiphyseal extremity is the part injured, the conditions are also favorable, even when the adjacent joint is involved. In future, good hope of success may be entertained of saving life and limb without operative interference in similar cases.

When the bullet passes through the lungs, it leaves a cylindrical tract that is smaller than the bullet. The tissues are but little contused and splinters of rib are seldom taken in. If the bullet strikes transversely and carries fragments of rib with it, or injures a large vessel or bronchus, of course the damage is most serious. In many cases diagnosis is only arrived at by the positions of the wounds of entrance and exit. In many cases there are subcutaneous emphysema, hemoptysis, dyspnea, and pneumothorax or hemothorax. When death occurs, it is due to injury of the great vessels or bronchi at the root of the lung.

MacCormac says that, excluding suicide, the mortality in these cases is 12.5%. Unfortunately, gunshot wounds of the brain and abdominal cavity are as fatal as before. In the Franco-Prussian War 10% of the total number of gunshot wounds were of the head, but only half of these were perforating. In future every bullet which hits the head, even up to 2000 yd. and more, will fracture it extensively, and at 3000 yd. the bullet will probably enter it and lodge. These cases almost invariably die immediately from injury to brain-tissue and shock, or die from hemorrhage and subsequent inflammation. To these the ordinary rules of practice must be applied.

In gunshot wounds of the abdomen nothing is of any avail but very early celiotomy, for after the onset of peritonitis operation will come too late.

MacCormac's conclusions are that in future wars many wounds will be less severe and more amenable to treatment than in the past. There will be a very great number of severe injuries, because of the long range and penetrating power which enable the projectile to traverse the bodies of several individuals in line, including bones, and to inflict serious wounds at a distance of 3000 or 4000 yd. It is impossible to say what the proportion between these two is likely to be. At nearer range the explosive effects will be about the same as before, but at long range the small bullet track, the slight external orifice, and the very moderate degree of comminution and fissuring of the bone will be of great advantage. These will form the bulk of gunshot injuries of the future, for it would seem impossible with magazine quick-firing rifles to maintain a

contest at close quarters without speedy annihilation of both parties. The number wounded in proportion to the number engaged will be greater.

Sir William thinks that the next great war will be more destructive to human life than any of its predecessors, and that the number of injuries, and often the severity of injuries, will be increased, but that very many cases will remain less severe and more capable of successful treatment and less likely to entail future disablement. It is the constant effort of surgery to provide anti-septic protection in an effective form in time of war; and the medical organization during England's last war with Egypt was so complete in this respect that not a single case of infective wound-disease occurred in the whole campaign. Some form of anti-septic occlusion will prove most generally applicable. The small wounds of entrance and exit render this plan comparatively easy and lessen considerably the dangers of infection. The fact that a bullet is lodged is no longer sufficient indication *per se* to attempt its removal: it is better to employ the eye rather than the hand at a first dressing-station, as Fischer has well said.[1]

Knaggs[2] reports a case of **gunshot injury produced by the Lee-Metford rifle.** The rifle was discharged at a distance of about 10 yd. A small wound was found which was somewhat depressed on the left side between the 9th and 10th ribs. It was surrounded by a contused ring $\frac{1}{8}$ in. deep. The wound of exit was on a level with the 3d lumbar vertebra, and 1 in. to the right of the spine; it was about the same diameter as the wound of entrance, and presented three everted triangular flaps. There was no contusion about it and no external hemorrhage. The patient died in a few hours, and postmortem examination showed that the spleen had been torn by the passage of the bullet. The substance of the spleen was exposed and protruded from the capsule. In other words, the wound of the spleen was distinctly explosive. The jejunum was injured, and two elliptical pieces of bowel were destroyed, amounting to half the diameter of the gut. The edges of the wounds were contused, and blood was extravasated between the layers of the mesentery. The psoas muscle on the left side was perforated opposite the 3d lumbar vertebra; the opening in the muscle was about $\frac{1}{2}$ in. in diameter. Surgeon-lieutenant Jay Gould[3] makes some observations upon the Lee-Metford bullet obtained from a study of cases of those injured by the actions during the Chitral expeditions. This paper has been commented on by Sir William

[1] *Gunshot Wounds in the Transvaal.*—The recent crisis in the Transvaal, as shown by the report of Prof. Liebmann, secretary-general of the St. John Ambulance Association in South Africa, is responsible for about 40 cases of gunshot wound. The report chronicles some unique data for students interested in this class of injuries, of which the following is a summary: Wounds made by the Lee-Metford rifle were much cleaner and healed more quickly than injuries inflicted by any other weapon. One burgher, shot through the lungs, left the hospital convalescent the next day, and another, shot through the head, lived for ten days afterward. The Lee-Metford bullet completely shattered bone it came in contact with, and did little injury where the wound was confined to the fleshy parts, while the Martini-rifle bullet made large, jagged, ugly wounds with bad apertures of entrance and worse of exit. The Lee-Metford is, therefore, conceded to be inferior to the Martini rifle (Am. Med.-Surg. Bull., Apr. 25, 1896).

[2] Brit. Med. Jour., July 20, 1895. [3] Ibid.

MacCormac in a previous article, and contains valuable conclusions. The body of the 3d lumbar vertebra had been struck, and a piece of bone had been destroyed about $\frac{1}{2}$ in. in depth immediately below the intervertebral disk. From the lower angle of this cavity to the inferior surface of the angle of the vertebra the bullet had passed across the spinal canal, and then split the right lamina from its junction with the spine through the inferior articular process. One would have expected that the discharge of the modern projectile at such a close range would have produced more severe effects with great comminution of the hard parts than was found in this case. We would have expected the wound of exit to have been of much greater extent. This case goes to prove the contention of Prof. Horsley, that the destructive effects of bullets with high velocity vary directly as the viscosity of the body.

Girard[1] of the U. S. Army makes a report of the effects of the **Krag-Jorgensen rifle-wounds** upon the skull of the living, and maintains that it is a fallacy to consider that the modern rifle inflicts humane injuries. The case was a military convict who attempted to escape, and who was shot through the head. Girard saw the man a few minutes after he was shot. He was entirely unconscious, and death was obviously a question of a few minutes. A thorough examination revealed two bullet wounds—the wound of entrance in the upper occipital region, the wound of exit in the forehead. The sentry had fired at a distance of 10 feet, and the bullet after passing through the man's skull went through a tree 8 in. in diameter and buried itself 2 ft. in the ground. The man died in half an hour. The postmortem observation showed that the bullet had an "explosive" effect.

A **case of gunshot wound** is reported by Walter Reid[2] of the Royal Naval Hospital, Haslar, illustrating the diagnosis of metallic substances in the body by the electric probe. On probing the wound the instrument came into contact with a rough material, but could be passed beyond it into the abdominal cavity. The surgeon proposed to make an exploratory incision, but the patient objected to any further operations of the sort being done for the present. Nélaton's probe gave no certain indication, and when the points of a pair of electrical forceps were brought down upon the hard surface the magnetic needle was not deflected. Lt. Bacon of the Naval Torpedo School at Portsmouth decided that the claws of the forceps were not sharp enough to penetrate any nonconducting film arising from oxidation or other chemical combination upon the surface of the metal. He devised a probe consisting of two sharp needles which were insulated over each other, the points being exposed $\frac{1}{8}$ in. apart. Wires led to a single bichromate cell and galvanometer. When these needles were brought firmly down upon the foreign body the magnetic needle was at once deflected. The patient was now convinced of the necessity of operation, and a piece of steel $1\frac{1}{4}$ in. long and $\frac{3}{4}$ in. in diameter was removed. It lay in the abdominal cavity, and in this cavity the surgeon could place his finger. The patient made a good recovery. It is obvious that there is a necessity to have sharp points upon electrical probes, and a

[1] Jour. Am. Med. Assoc., Oct. 9, 1895. [2] Brit. Med. Jour., Jan. 4, 1896.

fair pressure applied in working them, so that if no deflection is obtained, it may be confidently asserted that no metal has been touched.

Wilson [1] of Oregon reports a remarkable case in which there were **multiple gunshot wounds of the intestine;** there was a resection of 43 inches of ileum and anastomosis with Murphy button; the patient recovered.

Lilienthal [2] suggests a **bullet-probe and bullet-forceps** new in principle. The instrument is founded upon the fact that when two dissimilar metals—for instance, silver and copper coin—are held simultaneously in the mouth, one upon the tongue and one beneath it, there is a distinct and unmistakable electrical sensation, together with a strong metallic taste, which is perceived as soon as the metals are brought in contact, and not before. The sensation is continuous as long as one metal touches the other. Sensitive individuals may even see a slight flash of light. His apparatus consists of a mouth-piece made up of two metals which fit at the sides of the tongue, one of copper and one of zinc, completely insulated from each other by being set in a hard-rubber frame. Two insulated wires are connected, one with the zinc plate, the other with the copper. The probe itself is a metal tube containing the continuations of the wires just mentioned. The tip of the probe is isolated from the shank by a hard-rubber washer. The tip consists of an even number of bright metallic pieces separated from each other by thin hard rubber or similar material, and connected with the insulated wires in the probe. The hidden wires are firmly fixed to a plug into one end of the shank, so that they cannot be drawn tight. From this plug come two connecting pins to which the wires from the mouth-piece are to be attached. When the operator holds the mouth-piece in position by closing his teeth upon it, nothing is perceived until the electrodes in the probe-end touch metal, when an immediate, continuous, and unmistakable sensation, together with metallic taste, ensues. No contact except a metallic one will produce this phenomenon. The current engendered by the mouth-battery is too weak to be appreciated until this battery is short-circuited.

Lilienthal gives the following rule for improvising this probe: Cut both ends off a soft catheter. Take two pieces of wire and insulate them to within an inch of their ends by wrapping round each wire a layer of gutta-percha tissue and then warming, or even winding the wire with adhesive plaster. Run the wires through the catheter, allowing two ends to project at the proximal end. Two short ones, each bent on itself so that a smooth loop of wire may present, instead of a rough cut, should project at the distal end. The wires are fixed at each end by drops of sealing-wax. The long ends of the wire are now wound tightly around two coins, the one around a copper, the other around a silver coin, previously removing as much as necessary of the gutta-percha insulation. Entirely cover these connections with sealing-wax, and this probe will now work well enough for an emergency.

Lilienthal has also devised a bullet-extractor. He takes one blade of an American bullet-extractor which is insulated by hard rubber to within a tenth of an inch of its tip. An ivory peg is used instead of the usual steel lock-screw or lock-peg. A connecting pin is soldered to each handle with the connecting

[1] Ann. of Surg., Sept., 1895. [2] Ibid., May, 1896.

wires, which go to the mouth-piece, and when the forceps holds the bullet the operator instantly and constantly perceives the mouth-phenomenon.

Fowler[1] has made an elaborate study upon the **localization and removal of missiles from the cranial cavity.** He tells us that the traumatism of the bullet differs from that arising from any other cause, for the reason that, no matter how slight and apparently simple the injury, the element of concussion always enters into the case, and is to be added to the other existing symptoms. We cannot have a bullet injury of the head without concussion, and the concussion caused by firearms is far greater than that produced by any other means. The mere fact that a bullet strikes the head causes concussion; it does not need to enter it. Hence the primary symptoms of bullet-traumatism are the symptoms of general shock. The immediate effects of all bullet-injuries of the skull are manifested upon the medulla. In the concussion the pneumogastric center and the inspiratory center are either inhibited or paralyzed, and those portions of the brain that have localizing functions fail to give evidence of their specific functions until the concussion has passed off. The extraordinarily rapid rate with which the function of the respiratory center in the medulla oblongata is inhibited or fails altogether is peculiar to gunshot injuries of the head. There is reason to believe that the prompt use of artificial respiration may restore these functions in even the most apparently hopeless cases, and that no person should be pronounced dead from a bullet-injury to the head, other things being regarded, unless artificial respiration has been tried and failed. The heart's action may be either retarded, as in moderate concussion, or accelerated, as in intense concussion. The secondary symptoms of gunshot wounds of the head are very varied and misleading, and they may be positively absent even up to the time of death. The first point a surgeon must determine when a fracture is found, but there is no evidence of perforation, is whether or not the ball has passed through the bone between the depressed fragment and adjoining sound bone, the former springing back from its natural elasticity after the bullet has entered the cranial cavity. Surgeons will remember Von Bergmann's case, in which there was a fissure at the point of entrance, and yet on autopsy a bullet was found in the brain. Another fallacy is that we may find an opening of exit in cases of complete penetration. This shows that the bullet should always be closely inspected when recovered. Great difficulties may be encountered when the bullet enters from the cavity of the mouth. Here there should be an immediate search of the cavity of the skull to determine if there is any projecting area of the surface or evidence of fracture. If there is no such damage or sign of fracture, the surgeon must try and determine if the bullet could have lodged in the nasal fossa or one of the axillary sinuses. There is another fallacy to be borne in mind, that the patient may have simultaneously received other injuries, and that these other injuries, and not the bullet-wound, give rise to the cerebral symptoms. Gunshot wounds of the face may enter the cranium or may stop short of it. When we have decided that a bullet has perforated the skull, we must next determine

[1] Ann. of Surg., Nov., 1895.

if it has perforated the dura. In order to do this remove a button of bone by the trephine when the vault is involved, or enlarge the opening in the bone by the chisel or mallet or cutting forceps. Of course all of these procedures are done with the most rigid adherence to accepted theories. The bullet may be found upon the dura or between the dura and the inner table of the skull at the site of the wound or at a point remote from the original point of entry. This may occur in the case of a spent ball or one which has lost its projectile force immediately after entering the skull. The dura may be injured by splintered fragments of the inner table, whereas the bullet itself can remain extradural. The ball may pass but a short distance into the brain-substance, and be felt by the surgeon's finger after enlarging the opening in the dura. In cases in which the bullet passes but a short distance into the cerebral mass splintering of the internal table seems to be greater than when we have high velocity. When both tables are broken the inner table suffers most. This is not due to greater brittleness of the inner table, as used to be taught, but is according to Teevan's law—that is, that fracture commences in the line of extension rather than in the line of compression. We know for a fact that when the inner table receives the force of a bullet first, the outer table is the one which is most extensively broken. The ball may be discovered within the dura and just below the point of entry. When the ball does not lie just below the point of entry, we have to consider the question of the direction which the projectile may have taken in penetrating the cerebral mass. A ball may be lodged in the substance of the hemisphere. It may cross the hemispheres and lodge in the opposite walls of the skull, and it may be without sufficient force to penetrate this wall and turn back again, and after a recurrent course of from 1 to 3 in. may lodge in the brain-substance or the ball may pass clear through. The probable position of the ball is based on the position of the weapon at the time of shooting. The surgeon should thoroughly inspect the opposite side of the head to see if there is a perceptible bulging or evidence of fracture, but even the exact primary course of the bullet is always uncertain, and the difficulty of diagnosis is aggravated by the fact that a ball may be deflected from the opposite wall and lodge at a remote point. In 1884, Flührer reported a case in which he trephined at the point of impact against the opposite wall in order to trace the course of the deflected ball.

Ruth disagrees with Flührer's statement that the bullet may be deflected after striking the opposite wall, and he asserts that a ball will rebound only when it is flattened at least one-third, and that a velocity that could produce a third flattening would inevitably penetrate the skull. According to this last observer, if the ball strikes the surface at a right angle or within 15° of a right angle, and does not penetrate, it will not rebound, but will lodge at or near the point of impact. Ruth says that when deflection does occur it is almost invariably at angles of more than 90° to the angle of coincidence. In cases of complete penetration the first attempts to search for the bullet will be made by means of the finger. This may discover splinters of bone even if the ball is not located, and these splinters are at once removed. If the surgeon fails to

find the missile in this manner, he considers the question of probing the brain. No sharp-pointed instrument or pocket-case probe should be used. Whatever material the probe is made of, it should have a spherical or olive-tip mounted upon a slender shaft in order to lessen friction in its contact with the collapsed bullet-track. We should know the caliber of the weapon in order to be able to select a proper sized probe. A bullet of 32 caliber requires a tip $\frac{1}{4}$ in. in diameter, and the bullet-track of one of the smaller weapons should be explored by a probe $\frac{3}{16}$ in. in diameter. The amount of force to be used varies with the size of the tip and with the nature of the injury. In small tips we must use less force than in large tips. Ruth thinks we should employ a device whereby we could obtain the exact pressure in ounces while using the probe. If possible we depend on gravity alone to carry the instrument through the bullet-track.

Fowler has devised an instrument after the plan of Ruth which he calls the **graduated-pressure brain-probe.** He uses it in the horizontal position in order that the weight of the instrument and gravity may be eliminated from consideration. As long as the pressure made is within the limits of the spring, as shown by the indicator and scale, the probe is in the bullet-track, but as soon as the tip leaves the path of the missile this will be shown by an amount of force necessary to propel it forward. Contact with the bullet or fragment is announced by the characteristic click in the telephonic receiver applied to the ear. Attempts have been made to locate the exact position of the bullet in its relation to the surface, and to indicate the exact point at which a counter-opening may be made by the trephine. Morgan devised such an instrument. For detecting a bullet Nélaton's probe is far inferior to Girdner's probe. Search for the bullet by a long slender and blunt needle passed through the cerebral substance, avoiding the sinus of the dura and the medulla, has been employed, but without success. The large number of cases in which recovery without operation has followed bullet-wounds of the cranial cavity, and the supposed comparative infrequency of recovery in cases in which operative interference is instituted, have thrown doubt upon the justifiability of surgical intervention, and differences of opinion existing as to the advisability of doing more than trephining for the removal of splinters of bone and the bullet if it is within easy reach.

Hahn has given statistics of cases in which operation was performed and bullets removed, and those in which it was not practised. The introduction of aseptic and antiseptic surgery has modified results. Of 60 reported cases of operation, 40 died and 20% recovered. There are really more deaths in 20 nonoperative cases than are usually mentioned, because of late secondary effects.

Fowler then presents the divergent views upon the advisability of operation. He advocates operation in most instances, although he is inclined to adhere to the dicta of Von Bergmann, who does not operate when symptoms are absent, and does operate when there are important and severe symptoms of irritation. The author discusses the details of operating, the mode of arresting hemorrhage, and the after-treatment. The entire paper is of extreme value, and its conclusions are drawn from the literature of the subject and from cases which the author has had under his own charge.

OBSTETRICS.

By BARTON COOKE HIRST, M. D., and W. A. NEWMAN DORLAND, M. D.,

of Philadelphia.

The Chief Features of the Year's Work.—In obstetric circles among the points of more than usual interest one of the principal has been the application of Dührssen's and Mackenrodt's vaginal celiotomy in the treatment of extrauterine gestation. This is a recent suggestion, originating, as might be supposed, among the advocates of this method of pelvic surgery, who claim for it a diminished amount of shock and a lessened mortality. While it is interesting to note the performance of this operation for the relief of such a condition, it is far too early as yet to state what may be its possible outcome, but the increased danger of sepsis and the greater mechanical difficulty of the vaginal method as compared to abdominal section are strong objections to its general adoption. Symphysiotomy, after passing through a phenomenal tidal-wave of popularity, is now finding its proper level as a valuable conservative operation, of, however, but limited applicability, having an appreciable mortality and attended with a fair proportion of unpleasant complications and sequelæ. That it is undoubtedly preferable to craniotomy upon a living and healthy child is universally conceded, but there is a warrantable uncertainty, all things being carefully weighed, as to its superiority to Cesarean section. Especial commendation is due Barbour of Edinburgh for his admirable studies upon the mechanism of labor as revealed by frozen sections of women dying during the process of parturition. The results thus obtained from an examination of 23 cases must very truly be classed among the most important contributions made during the last half century to the science of obstetrics. Through these investigations more accurate information has been obtained as to the process of placental separation and the arrest of postpartum hemorrhage, as well as of the various stages of fetal and placental expulsion. Malignant deciduoma and its intimate relationship with a preexisting cystic degeneration of the chorion is a subject of growing interest, and one that, next to symphysiotomy and labor subsequent to anterior uterine fixation, has commanded the largest share of obstetric study during the past year. The relationship of this neoplasm to the sarcomata may be said to be already fully established, and the frequency with which the condition, rare at the best, has followed a previous hydatidiform mole must be regarded as more than a mere coincidence. Fränkel's microscopic investiga-

tions have largely contributed to our knowledge of the pathology of the disease, and this, together with the accumulation of clinical records, combines to establish its morbific entity. The serum-treatment of sepsis is a novel procedure which is entirely too new to criticise safely. While, according to some observers, beneficial results promptly follow the subcutaneous exhibition of the antitoxic serum, in the hands of others equally as able it has signally failed; and it is to be feared that it will follow the beaten path already taken by tuberculin and the other antitoxic serums. The future results of this mode of treatment must, however, be closely studied in order to arrive at any positive conclusion as to its efficacy in puerperal sepsis. Finally, to the numerous causes of maternal dystocia already existing, and which perplex the obstetrician, must be added one other—namely, that arising from the various forms of anterior fixation of the uterus performed for the relief of uterine retrodisplacements and prolapse. The current literature is teeming with reports of difficulties arising during gestation and labor directly consequent upon the results of these operations, and the very practical and serious question presents itself, Which is the greater evil—the gynecologic condition or the obstetric difficulties consequent upon its *improper* method of correction? We term the method "improper," not because of the idea involved, for anterior fixation for the relief of these displacements is eminently rational in every sense of the word, but because we believe that the fixation has not been carried out in an absolutely proper manner. The idea is correct, but the technic is imperfect. This can only be demonstrated however, by time and an investigation as to the relative frequency of dystocia after the various forms of anterior fixation.

PRELIMINARY AND GENERAL CONSIDERATIONS.

Obstetric Education.—[The demand for a more thorough obstetric education is increasing year by year, in England as well as in the United States, notwithstanding the fact that there still lingers in the British General Medical Council some of the traditional hatred for the practice of midwifery.] Rentoul[1] deplores the condition of affairs, and makes the alarming statement that even as late as 1893, in England and Wales, of a total of deaths of 569,958 persons, 5950 were women who died from puerperal fever and the other accidents of childbirth; that is, at least 1 death in every 95 of the total deaths was that of a woman in childbirth. [In the best of hands in the United States the mortality of childbirth has now been reduced to slightly under 1 %.] He further declares that Duncan has shown that 1 in every 15 women in first confinement dies, thus making the maternal mortality much higher than that following major surgical operations. He believes that the medical student should personally conduct, under the direct supervision of a registered physician, at least 30 labors before a diploma be granted him. Grothan[2] writes in a similar strain, and especially decries the evil practices of the so-called midwives, who have no knowledge of even a normal presentation, and are grossly ignorant of all the dangers that surround the lying-in

[1] Brit. Med. Jour., Nov. 23, 1895. [2] Wilkinson's Clinic, Sept., 1895.

woman and her infant. In New York City, in 1891, 24,123 birth-returns were made by midwives, this being nearly half of the whole birth-returns. The largest proportion of stillbirths and maternal fatalities were under the care of midwives. Often men of true science and ability are obliged by popular opinion to stand aside and view the malpractice of the ignorant midwife who undertakes the care of two lives with all their perils. [It is to the medical profession that we must look for a reformation, and, fortunately, the protestations of the past few years are beginning to bear fruit in the form of stricter regulations and laws of registration, and in an awakening interest in the science of obstetrics in medical colleges and among medical students.]

Material of Obstetric Instrument-Cases.—Von Herff[1] calls attention to the utility of aluminum as a material in a case for obstetric instruments. The lightness of the material makes it possible to construct a case sufficiently large to carry the forceps and other instruments, and in which they can be sterilized without taking them from their position. The size of the forceps has rendered other cases too heavy to be conveniently carried.

THE PHYSIOLOGY OF PREGNANCY.

Sterility.—Graefe[2] of Halle and Kleinwächter[3] have investigated the causes of sterility, and both have concluded that gonorrhea does not play an active causative role, as is generally supposed. In 648 cases of sterility Kleinwächter found but 80 in which the sterility could be ascribed with certainty to previous gonorrhea; in 12 of these the husband was known to have had gonorrhea. This gives a percentage of but 13 in which sterility in women can be ascribed to that cause; and Kleinwächter believes that even this estimate is too high, as his patients were of the lowest classes, in which such a cause would operate most frequently; $76\frac{23}{100}\%$ of his cases had married before the age of 21, and he ascribes the condition of sterility to this early marriage. In 14 cases malformations of the sexual organs were present. In 31 cases some constitutional condition on the part of the husband was the disturbing element; $50\frac{77}{100}\%$ of the patients suffered from dysmenorrhea, but Kleinwächter holds that no relation exists between dysmenorrhea and sterility. Graefe enumerates the causes of sterility as follows: 1. Anomalies of the hymen or malformations of the genital tract; this includes a very large vagina, which permits the escape of the semen immediately after coitus; 2. Vaginismus; 3. Excessive acid reaction of the vaginal mucus, which causes the spermatozoa to lose the power of motion; 4. Narrow external or internal os, anteflexion, retroflexion, endometritis, gonorrhea (especially with involvement of the adnexa), and neoplasms; 5. Constitutional diseases, as tuberculosis, syphilis, chlorosis, and obesity. He believes that in half of the cases the trouble is due to some defect in the male. Only 8 of Kleinwächter's cases were cured by appropriate treatment. Electricity failed signally in every instance. In connection with this subject it would be well to note that during

[1] Centralbl. f. Gynäk., No. 39, 1895.

[2] Ibid., No. 49, 1895.

[3] Zeit. f. Geburtsh. u. Gynäk., 1895, Bd. xxxiii. H. 2.

recent years the birth-rate per thousand population has been diminishing in proportion to the population in most civilized countries, as will be seen by reference to the following table, taken from the Canadian Practitioner for July, 1895:

Country.	1880.	1890.
United States	36.0	30.7
England and Wales	34.2	30.2
Scotland	33.6	30.3
Ireland	24.7	22.3
France	24.5	21.8
Belgium	31.1	28.7
German Empire	37.6	34.7
Austria	38.0	36.7
Switzerland	29.6	26.6
Denmark	31.8	30.6
Norway	30.7	30.0
Netherlands	35.5	32.9

[That there does exist some occult relationship between sterility and increasing civilization there can be no doubt, and in this relationship doubtless will be found the solution to the Malthusian problem. It would be a matter of much interest to determine accurately why there are fewer births among civilized people than among the aborigines. Increased sexual torpidity in some instances, in others an exhaustion of the sexual power from excesses, and in others the ravages of venereal diseases, may account for the condition.]

Conception and Fecundity.—[The remarkable vitality of human spermatozoa is a well-recognized fact. Various authorities state that the spermatozoa may continue to move during from 24 to 84 hours after death in the fluids of the seminal tract. Outside the body the movement of the spermatozoa has been observed for 72 hours by Hofmann and Mantegazza at a suitable temperature.] Piersoll[1] now remarks that at a temperature of 8.5° C. a few of the elements showed movement after being kept for 9 days. [These facts prove still more forcibly that spermatozoa may long retain their vitality in the female generative tract, and this must command in future due consideration in connection with certain medico-legal subjects.]

A question of more than ordinary interest, and one that has excited considerable controversy, is that which concerns the procreation of sex at will. Petrus Truong Vinhky of Annam, in a letter quoted by Stephenson,[2] claims to have evolved a theory upon which this power may be acquired. His plan of action is founded on the "system known as dualism, or the *bina principia* (*âm et duong*), male and female principles (*principes opposés*), alternating and constituent of the life of human beings, as well as of the existence of things in nature. In all that is we must recognize the control of definite laws (conditions of existence). Moreover, the procreation of male and female is one of the fundamental bases of terrestrial life." "Furthermore, physicians all recognize that there are in the ovary of woman both male and female germs

[1] New Orl. M. and S. Jour., July, 1895. [2] Boston M. and S. Jour., Mar. 26, 1896.

(potentially?). These two opposite elements should act alternately. Knowing, then, the beginning and the duration of this alternate action, our course of procedure becomes plain." On such a basis as the foregoing Vinhky succeeded perfectly in alternating son and daughter in five successive pregnancies, and then, desiring sons only, he engendered such. He intends to demonstrate this theory in a series of lectures at Paris during 1900.

Longfellow[1] reports a case of impregnation of a single woman from semen deposited on the vulva without vaginal impenetration. Examination revealed advanced pregnancy, with, however, a virginal condition of the vulva, a thin intact hymen, and a vagina so small as to scarcely admit the finger. Duhousset[2] reports an impregnation of one sexual pervert female by another, who had married, but who continued her relations with the other. The unmarried female had an enlarged clitoris by which coitus was performed; much to her astonishment, she became pregnant, when the married pervert admitted that she had indulged with her friend immediately after having had coitus with her husband. Gleaves[3] adds another case of precocious motherhood to those already on record. This girl gave birth to a well-formed child when at the age of 10 years and 2 months. She lacked the development of a woman, although she had menstruated regularly from the age of 5 years. The labor was short and uneventful, and 2 hours afterward the girl wished to get up and dress. The mammary glands were undeveloped, and there was no secretion of milk. The infant lived for a week.

The Female Pelvis in Primitive Races.—Stratz[4] investigated a series of cases in Java to test the accuracy of certain theories in respect to the relative characters of the pelvis in European and in barbarian or semicivilized women. Faayer of Leyden declared 20 years ago that the Javanese pelvis was unusually round at the inlet. Stratz reminds obstetricians that this theory was based on the examination of a few macerated pelves. He therefore measured a large number of pelves of Javanese women living up country. Two races were included in his series, the more primitive being darker, more slender, and smaller. The measurements showed little or no difference more than could be explained by the small general proportions of one of the races. The same may be said of the difference between the average Javanese and European pelvis. [As it happens, however, the theory of Faayer seems substantially correct, the transverse measurement of the Javanese pelvis being, on an average, relatively small. The obstetric teacher should also bear in mind that Stratz found plenty of contracted pelves among these primitive women, who, escaping the evils of civilization, do not enjoy its benefits. This would seem to weigh against the generally accepted theory that with advancing civilization, with its improper mode of dressing, pelvic contraction is increasing in pregnancy.]

The Position of the Fetus in Utero.—Pajot's law of accommodation,

[1] Buffalo Med. Jour., Oct., 1895.
[2] Ibid., Oct., 1895.
[3] Med. Rec., No. 1306, p. 715, 1895.
[4] Nederl. tijdschr. v. Verlosk. en Gynecol., 6th year, part 1, 1895.

while generally accepted as the probable cause of the common cephalic presentation of the fetus, is not universally so. Davidson[1] thinks that Simpson's theory is pretty doubtful yet, and believes that the ovoid shape of the uterus has little effect upon the presentation of the fetus, and, indeed, that the uterus is compelled by the position of the fetus to assume that shape. Basing his idea upon the observations of the larvæ of the hymenoptera, which always turn their heads to the natural outlet, Davidson concludes that both the theories of "gravitation" and "adaptive action" are inadequate. In the human subject the mothers whose fetuses presented otherwise than by the head would, in the savage state, gradually die out. "The cephalic presentation, whether at first an accident or an inheritance from the lower forms of life, as seems the more probable, is instinctive in the fetus now." Davidson therefore thinks that the cephalic presentation has become the normal one for the higher mammalia by a process of natural selection. Cameron[2] advances an entirely new theory as to the longitudinal position of the fetus *in utero*. He believes that the child invariably assumes a definite posture in its relation, not to the pelvis, as has hitherto been assumed, but to the site of the placenta. His experience in Cesarean section has shown him that in dorsoposterior positions the placenta is attached upon the anterior wall, while in dorsoanterior positions the placenta is upon the posterior wall. Thus, in the first cranial position (L. O. A.) the placenta will be found upon the posterior wall, and somewhat to the right side. In the second cranial position (R. O. A.) the placenta will be upon the posterior wall, and somewhat to the left side. In the third cranial position (R. O. P.) the placenta will be upon the anterior wall, and somewhat to the left side. In the fourth cranial position (L. O. P.) the placenta will be upon the anterior wall, and somewhat to the right side. The fetus and placenta will be found in the same relation in the various pelvic positions. This being the case, it may be readily understood how this arrangement favors the well-being of the fetus during labor, as then, during a uterine contraction, the back of the fetus can apply itself to the uterine wall with advantage, whereas if the placenta intervened asphyxia would result, more especially after the membranes had ruptured. The relative frequency of the four positions of the vertex are as follows: First position (L. O. A.), 67%; second position (R. O. A.), 10%; third position (R. O. P.), 20%; fourth position (L. O. P.), 3%. Therefore, in 77% of the cases the placenta would be upon the posterior wall, and in 23% of the cases upon the anterior wall. [The early development of the placenta and membranes would be a strong point in the support of this theory.]

The Heart in Pregnancy.—Handfield-Jones[3] in a series of lectures delivered before the Harveian Society has made an exhaustive study of the varying conditions of the heart during pregnancy, parturition, and the puerperium. With regard to the *bruit de soufflet* recognized by Larcher, Beau, and others, and considered by them to be a nearly constant concomitant and index

[1] Glasgow Med. Jour., June, 1895. [2] Brit. Med. Jour., Feb. 29, 1896.
[3] Lancet, Jan. 18, 1896.

of left-ventricle hypertrophy, he records a contrary experience. In about 50 multiparæ examined by him during the 7th and 8th months he has heard this bruit only some 5 or 6 times. He has limited his observations to strong, healthy mothers, in whom one might reasonably expect hemic bruits to be absent. He does not deny, however, that a bruit is *occasionally* present in cases of pure left-ventricle hypertrophy. He also states that though occasionally left ventricular hypertrophy may not be very pronounced at the end of pregnancy, especially in feeble or poorly developed women, yet in the vast majority of healthy subjects this increase in thickness of the wall of the left ventricle is always present. He has obtained confirmatory evidence of this cardiac hypertrophy in pregnancy by watching the effect of rapidly growing abdominal tumors on the heart. He has found that in patients in whom abdominal tumors (of a size to reach nearly up to the xiphoid cartilage) have been removed, and examination of the chest has been made within a month after the operation, the heart's apex may often be found displaced downward and outward and the area of cardiac dulness increased. Again, in elderly women, should an abdominal tumor grow rapidly, heart-failure may be a prominent symptom at an early date, as the advanced age of the patient renders the development of compensatory hypertrophy to meet the rapidly increasing work less probable. He has made numerous observations with the sphygmograph to ascertain, as far as possible, the absence or presence of evidence of increased arterial tension in women advanced to nearly the full term of pregnancy, and in all instances in which the patient has been a strong, healthy woman he has found it present.

The Course of Pregnancy, Labor, and the Puerperium in Young Primiparæ.—From 260 cases of pregnancy in very young women treated in the clinic at Marburg during the past 18 years, Spitta[1] concludes that the gestation is generally not associated with more annoying symptoms than in older women. Labor usually takes place before the end of 40 weeks, and is apt to be long and tedious, partly on account of weakness of the labor-pains and partly owing to the small size of the undeveloped pelvis. Dystocia, due to the bony pelvis, is much more uncommon than obstruction from the soft parts, which latter are apt to be more or less lacerated during the labor. Postpartum hemorrhage, fever, and sore breasts are of frequent occurrence. Forceps are indicated oftener than in older primiparæ. The mortality for both mother and child seems to be but little increased.

Decidual Formation.—F. Nordmann[2] has given his conclusions, founded upon careful macroscopic and microscopic examinations of 5 gravid uteri, in regard to the oft-mooted question as to whether the lower segment of the uterus contains uterine or cervical mucosa, and whether the cervical mucosa undergoes decidual changes. He believes, first, that the lower segment belongs, both in its muscular structure and in the character of its mucosa, to the body of the uterus, its mucosa acting in the same manner as that of the body in the development of the decidua; secondly, the cervical mucosa takes part

[1] Centralbl. f. Gynäk., No. 51, 1895.

[2] Ibid., No. 27, 1895.

at no time during pregnancy in the formation of the decidua, the cervix itself normally remaining closed practically throughout this period; thirdly, the internal os is situated where the muscular structure of the body suddenly diminishes in thickness. The latter sends out only single muscular fibers in and around the fascia surrounding the cervix. At this spot the decidua ends and the unchanged cervical mucosa begins.

The Placenta and Placental Circulation.—The development and normal structure of the human placenta was the subject of a paper read by Eden before the Obstetrical Society of London, June 5, 1895. The placenta consists of 2 portions, a fetal and a maternal, the fetal being developed from the external fetal envelop or chorion. At the end of the second week the chorion is covered with villi, the reflexa has closed over the ovum, and the tips of the villi are loosely imbedded in it. The fetal and maternal vessels are thus brought into close relation, and the general arrangement represents a simple type of diffused placenta. The development of the discoidal placenta merely consists in the specialization of a part of the chorion. The placental chorion consists of 3 sets of structures: (1) a covering of epithelium, (2) a connective-tissue stroma, and (3) blood-vessels. The chorionic epithelium consists of two layers; the superficial layer or trophoblast represents the fetal epiblast, and is the more important of the two. By a process of proliferation buds are formed from the trophoblast, which develop into new villi. The stroma consists of a delicate reticulum of branching connective-tissue corpuscles with numerous leukocytes. The meshes of the stroma form a system of lymphatic channels that are in communication with the capillaries. The vessels of the villi are very large and numerous, and run for the most part immediately beneath the epithelium; this is an arrangement favorable to osmosis. The lymphatic system of the stroma can be artificially injected from the capillaries. In an uninjected placenta blood is often found in the stroma, so that the villi appear to be soaked with blood like a sponge. The maternal placenta is developed from the uterine mucosa. The earliest changes are a continuation of those found in menstruation, for the fertilized ovum is engrafted on the mucosa in its active phase. The development of the decidua consists of three stages. In the first stage extensive hemorrhages occur in the decidua, and decidual cells are formed in large numbers from the connective-tissue corpuscles. These changes are preparatory, and can be found in all parts of the decidua during the first months. In the second stage the chorionic villi invade the serotina and the maternal vessels are opened up, thus establishing a circulation through the intervillous spaces. The invasion of the serotina appears to be the result of the great activity of the trophoblast layer. The decidual cells also show great activity in the absorption of blood effused into the serotina. Large lacunæ are formed by the opening up of neighboring vascular and glandular channels. The changes characteristic of this stage are found at the growing margin of the placenta up to the last weeks of gestation. The third stage represents the adult stage of the serotina. All active processes have then ceased, and the serotina has undergone some amount of consolidation and

repair. The intervillous spaces are, according to Eden, made up (1) of the space existing primarily between the decidua and the chorion; (2) of spaces formed by destruction of decidual tissue; (3) of glandular and vascular channels opened up in the same way. The circulation through the intervillous spaces is not rapid, the outflow being chiefly promoted by the intermittent contractions of the uterus. The giant cells so often described in the serotina are really imbedded trophoplastic buds. The fetal and maternal structures of the placenta are firmly bound together by the attachment of numerous villi to the serotina. Owing to this firm union, separation of the placenta during labor occurs, not between the fetal and maternal layers, but through the loose cavernous layer of the serotina.

Placental Transmission.—[The transmission of certain drugs and of bacteria and their products through the fetoplacental circulation is a well-recognized fact. The demonstration of this truth is, however, of such recent date that additional confirmatory data are welcome.] Bureau[1] attended a patient who for 7 years had taken morphin, and at the time of his attendance was taking 15 gr. daily. She was in her fourth pregnancy, and spontaneously gave birth to a child with talipes of one foot. As the cord was divided Bureau collected the blood of the placenta and umbilical vessels, and in this, on chemical analysis, morphin was detected. Ricker[2] reports a case of streptococcus infection from mother to fetus in a woman 27 years of age, who died in the sixth month of pregnancy of a disease diagnosticated diphtheria. By careful bacteriologic examination the streptococcus pyogenes was the only germ found, and it was obtained in pure culture from the placenta and from the liver of the fetus. No lesion was found in the fetus. Ricker recalls a second case in which the streptococcus was found in the blood of the umbilical veins of a stillborn child whose mother died shortly afterward from the effects of a phlegmon of the arm which was present at the time of birth. In neither of these cases was any lesion of the placenta discoverable. Freund and Levy[3] record a case of intrauterine infection with the typhoid bacillus, the miscarriage taking place in the fifth month of pregnancy and during the fourth week of an attack of typhoid fever. Cultures made from the spleen and heart's blood of the fetus and from the placental blood gave numerous colonies of the bacillus of typhoid. Cultures made from the outer surface of the placenta and from the vernix caseosa were sterile. No abnormality was found in the fetus, except a somewhat enlarged and slightly softened spleen; the intestine was normal. The infecting organism entered the fetus through the blood, and caused a septicemia such as has been observed in other cases of intrauterine transmission of organisms.

It may be that the mother may be afflicted with some pathologic condition during pregnancy, not resulting fatally to the infants, but giving rise to the formation of toxins in the blood. Necessarily, such a condition must be more or less detrimental to the infant's health, and Charrin and Nobécour[4] give

[1] Jour. de Méd. de Par., Oct. 20, 1895.
[2] Centralbl. f. allg. Path. u. Anat., vi. No. 2, 1895.
[3] Berl. klin. Woch., June 27, 1895.
[4] Arch. de Physiol., No. 1, 1896.

the results of interesting observations upon such infants. It was found that whereas a healthy child increases 32 grams each day, an infant born of a tuberculous mother did not gain in weight at all, while the child of a woman who died of tubercle had increased but 4.28 grams for each day. The child of a mother who before confinement had a very extensive phlegmon gained but 5.7 grams for each day. Experiments upon animals give similar results. The healthy infant loses but a moderate amount through the organs of excretion, while, on the contrary, toxins interfere with processes of nutrition and often seem to reduce a discharge of harmful waste to a minimum.

THE DIAGNOSIS OF PREGNANCY.

The value of an external examination of the pregnant woman at varying periods of gestation is urged by E. A. Harris.[1] Much can be learned by this method that it would be otherwise impossible to ascertain, and fetal death or pelvic contraction detected in time to institute active measures and thereby prevent maternal risk or death. Benttner,[2] in practising diagnosis by external manipulation, has found of especial value a method that consists in palpating the head with the two hands of the examiner. In one manipulation both hands are turned with their backs toward the abdominal surface of the mother, and firm but gentle pressure is made to distinguish the child's neck, the hands being placed beneath the chin and occiput. By the other manipulation the hands are turned in the same way, but one hand is pressed deeply behind the pubic joint, the palmar surface turned toward the pubis, while the other hand, with its dorsum toward the abdominal wall of the mother, presses in the sulcus between the head and the trunk.

The Use of *x*-Rays.—[As may have been expected from the practical application of the Röntgen rays in surgery, efforts have been made to test their applicability to the science of obstetrics, with, however, almost negative results.]

Varnier[3] and his associates publish a Röntgen-ray picture of a uterus at 3½ months, which had been taken from the body of a woman dying of pernicious anemia. The picture gives an indistinct outline of the fetus, which appears much darker than the surrounding contents of the uterus. Dissection of the specimen confirmed the diagnosis made from the picture. E. P. Davis[4] has instituted a series of experiments to solve the problem, Can the skeleton of the fetus be recognized by this method within the mother's womb? To ascertain the relative density of the pelvis and fetal skull to the rays the following experiment was made: The skull of an infant at term was placed in a female bony pelvis upon a sensitized plate completely sealed in a pasteboard box; the pelvis was placed in such a position that it rested upon the plate upon the tuberosities of the ischia and the coccyx, and the skull was laid obliquely in the pelvis. To secure as much definition as possible a lead diaphragm was interposed between the tube and the pelvis, and an exposure of 1½ hours was made to test thoroughly the various positions of

[1] Ann. of Gyn. and Pæd., Feb., 1896.
[2] Cor.-Bl. f. schweiz. Aerzte, No. 10, 1895.
[3] Ann. de Gynéc., Mar., 1896.
[4] Am. Jour. Med. Sci., Mar., 1896.

PLATE 2.



Pelvis and fetal skull (Am. Jour. Med. Sci., Mar., 1896).

the skull and pelvis subjected to the rays. An examination of the accompanying illustration (Plate 2) shows that the greater portion of the fetal skull gives but a very faint shadow under the action of these rays, owing to the deficient ossification. The base of the skull is dark, while the temporal region scarcely gives a reaction. In marked contrast to this is seen the black coccyx, which rested upon the plate, and also the rami of the pubes and the spines of the ischia. The direct inspection of the trunk of a living fetus with the skiascope revealed the fact that the rays permeate the trunk of the new-born child with facility, but that the skeleton casts but a faint shadow. The tube was 10 in. from the body, and the exposure was 45 minutes. Reference to the accompanying illustration shows the faint outline of the ribs, a dark shadow given by the sternum and underlying spinal column, a trace of the vertebral column, dark shadows cast by the crests of the ilia upon each side, and a shadow given by the stump of umbilical cord, which lay obliquely across the body toward the right, and by the granulating tissue at the umbilicus. The attempt to secure a skiagraph of the fetus *in utero* was attended with a negative result. [Obstetrically, it would seem that in its present imperfect condition the skiascope offers but little assistance in the diagnosis of fetal position and presentation. It may be, however, that under improved conditions minor degrees of maternal pelvic contraction may be detected in early pregnancy and an appropriate course of treatment instituted at the proper time.]

THE HYGIENE OF PREGNANCY.

Diet during Pregnancy.—Eichholz[1] believes that many of the ills that accompany parturition are brought about by improper diet during pregnancy. An excess of water and of albuminous food should be avoided—water on account of its tendency to produce hydroamnion; and albumin because it favors excessive growth of the child. He prescribes the following diet: Meat once a day; green vegetables and potatoes; avoid eggs, peas, and beans, as they are too rich in albumin. Wine and beer may be taken in moderation, but no more fluid should be taken than necessary. Under this regimen the patients are active until the eve of accouchement; they do not suffer from a sensation of fulness, excessive formation of fat, thirst, or constipation; delivery is rapid and easy, even in those cases in which the previous labors have been prolonged and difficult; there is never an excess of liquor amnii; the quantity and quality of the milk are always good; the children are small, but healthy and well formed, averaging about 6 pounds in weight, and the circumference of their heads being about 33.5 cm.

PATHOLOGY OF THE FETUS AND OF THE FETAL APPENDAGES.

The Placenta.—[We cannot agree with Schoolfield[2] when, in speaking of adherent placenta, he remarks that "placental inflammation is a moot question among authors, many denying its existence." This might have been

[1] Rev. de Thér., 1895, No. 18.

[2] Am. Jour. Obst., May, 1896.

true 8, or even 5, years ago, but the observations of many eminent investigators within recent years have amply demonstrated the existence of such a condition, dependent upon syphilitic infection, a preexisting endometritis, or other pathologic condition. Certain it is that its grave sequela, adherent placenta, is a well-recognized complication in obstetric practice.] Cases of this interesting and serious condition are recorded by Schoolfield and Nyulasy.[1] Nyulasy believes that the commonest cause of placental adhesion is antecedent endometritis. In his experience the usual condition is a deposit of fibrin originating in the decidua and involving the opposed surface of the placenta, thereby forming a tough cementing bond of union between the placenta and the uterus. The situation of the adhesion is generally the fundus uteri, and union is often especially firm at the cornua about the entrances of the Fallopian tubes. For retention of fragments of the adherent organ he considers the only effective treatment to be thorough curetment of the uterus.

In a study of *tuberculosis of the human placenta* in relation to congenital tuberculosis Schmorl and Kockel[2] state that the exact method by which the tubercle bacilli passed from the mother to the fetus was not understood at the time when Birch-Hirschfeld and Schmorl reported their case of congenital tuberculosis in 1891. Lehmann's observations show that in acute miliary tuberculosis during pregnancy the placenta may be affected with tubercle as well as the other organs. The placenta, it seems, may occasionally be affected in cases of chronic pulmonary as well as acute miliary tuberculosis. Autopsies on cases of advanced pulmonary tuberculosis frequently show circumscribed foci in organs other than the lungs, such as the liver, spleen, or kidneys. Gärtner has demonstrated that when animals with pulmonary tuberculosis are pregnant the fetus is not so very rarely infected with tubercle bacilli. Schmorl and Kockel have met with 3 cases bearing on the subject. (1) Autopsy revealed acute miliary tuberculosis; the subject was in the 8th month of pregnancy, and was brought to the hospital in an unconscious condition. Cesarean section was performed, but the child died after 2 hours. (2) The patient died during pregnancy with acute miliary tuberculosis. (3) A case of chronic laryngeal and pulmonary tuberculosis that died suddenly of profuse hemoptysis. Cesarean section was performed soon after death, but the child was found already dead. In all the cases placental tubercle was found, but only a very little in Case 3, and less in the placenta than in other organs in the other 2 cases. The tubercle bacilli were probably in all 3 cases carried to the placenta in the circulating blood, but in Case 2, in which there was also tuberculous peritonitis, the bacilli, though less likely, might also have been carried from the peritoneum into the uterus by the Fallopian tubes. In cases of acute miliary tuberculosis the bacilli circulating in the blood must be equally distributed to all organs, and the only way to explain why in Cases 1 and 2 less tubercle was found in the placenta than in the other organs is to suppose that the placenta is more resistant than other organs to the bacillus. In all 3 cases tubercle bacilli were found

[1] Intercol. Med. Jour. of Australasia, Mar. 20, 1896.

[2] Beit. z. Path. Anat., xvi., 1895, part 2.

in the fetal placental villi, but only in Case 2 were any bacilli found in the body of the fetus. Even in this case there were no macroscopic changes, but bacilli could be detected in the liver and in a lymph-gland in the neighborhood of the liver. The authors think that the reason why only few bacilli had passed into the fetal circulation is to be found in the changes produced in the vessels of the tuberculous villi. These changes, consisting in the closure of vessels by the formation of hyaline thrombi and the overgrowth of endothelium, to some extent form a barrier hindering the spread of tubercle to the fetal circulation.

The Umbilical Cord.—Interesting cases of tangling and coiling of the cord are reported by L. F. Bishop[1] and Wygodsky.[2] In Bishop's case the death of the fetus was due to an unusual entanglement of the cord. The fetus was born at about full term, but had been dead for some time. The left thigh was flexed on the body, and held in that position by the cord, which passed around it in a "half hitch" in such a manner that each movement of the child had tightened it until its circulation was cut off. The extremity of the child was edematous below a deep sulcus caused by the cord, and the point of pressure on the cord itself was easily seen. [This case is a beautiful proof of the fact that intrauterine amputations are not the result of funic coiling, fetal death resulting long before the severance can be accomplished.] Wygodsky records an instance of excessive coiling of the funis, the cord being wrapped 8 times around the fetus. It was coiled 7 times around the neck and once round the left shoulder, and there was also a distinct knot; it measured over 65 inches in length. The greatest number of coils of the umbilical cord hitherto recorded are—7 (Baudelocque), 8 (Credé), and 9 (Müller and Gray).

Funke[3] of Strassburg records the only assured case in literature of spontaneous intrauterine laceration of the umbilical cord. After the escape of very much amniotic fluid, while the patient on the next day was using the vessel to pass water a long cord fell out of the vagina; it was torn across, but was not bleeding. The fetal heart-sounds had not been audible for 10 hours. The portion of cord hanging out was 25 cm. (10 in.) long. The cervix allowed a finger to pass. Kolpeurysis of the vagina was done for the weak pains and loss of blood. After 12 hours the child was born by the breech; the placenta was removed in pieces ¼ hour after. The cord was torn off level with the fetal abdomen, but without opening the belly-cavity; there were no marks of strangulation, but the placenta contained a large blood-clot near the funicular insertion. The cord, 48 cm. long, was easily lacerable; the separation was at the division between the amniotic sheath and the navel-ring, and only a small tag of amnion was left with the fetus. Funke believes the separation was due to multiple twisting and displacement of the cord, for which the hydramnios gave plenty of scope.

The Amnion.—Premature ruptures of the membranes are discussed by Stapleford[4] and Galtier.[5] Stapleford records a case of rupture of the fetal

[1] Am. Jour. Obst., Feb., 1896.
[2] Centralbl. f. Gynäk., No. 48, 1895.
[3] Ibid., xviii. 31, 1894.
[4] Cincin. Lancet-Clinic, Nov., 1895.
[5] Thèse de Paris, 1895.

membranes 3 weeks before delivery, with persistence of the gestation to full term, at which time a living child weighing 5 pounds was born. Galtier discusses the cause of primary infection of the amniotic fluid after early rupture of the membranes. The nature of all of the microorganisms has not yet been discovered, but there have been found the streptococcus, staphylococcus, and bacterium coli. The infection produces changes in the consistence, color, and odor of the amniotic liquor, and often causes the formation of gas of fetid odor, even with living children. It may spread with great rapidity after the rupture of the membranes, and may occasion severe secondary and often deadly infections for the mother and child.

The Chorion.—Interesting cases of cystic degeneration of the chorion are recorded by Hastings,[1] Dirmoser,[2] Dorland,[3] and Champneys.[4] In Dirmoser's case there occurred an involvement of the substance of the uterine wall, the patient, however, recovering. Hastings' case was a primipara of 23 years who had been making efforts to terminate her gestation. The patient was over 3 months pregnant, but the uterus corresponded in size to the fifth month of gestation, and the mole filled a pint jam-jar. Champneys reports 2 cases, one a multipara of 40 years, and the other a woman 33 years of age who died of septic infection 9 days after the expulsion of the mole. Dorland reports the case of a multipara 25 years of age, who at the expiration of 4½ months in her fifth pregnancy expelled over 2 quarts of uterine hydatids, after which she made an uneventful recovery. In 1894, Kehrer of Heidelberg reported 50 hitherto unpublished cases of cystic disease of the chorion which he had gathered in 2 years' time from 48 midwives and physicians in the lowlands of Baden, hoping thus to arrive at a more accurate knowledge of the peculiarities of the disease than could be obtained by a study of reported cases. In reply to this paper Dorland has tabulated 100 cases of this rare disease, including 2 hitherto unreported cases, and from a study of this tabulation has arrived at some interesting conclusions. As regards the age of the patients at the time of the molar birth, his figures very closely approximate those of Kehrer. In 8% of his cases and in 4% of Kehrer's the patient was under 20 years of age, the youngest being a single girl of 13; 68% of Dorland's cases and 74% of Kehrer's occurred between the 20th and 40th year, while 16% of Dorland's and 22% of Kehrer's patients were over 40 years of age; 10% of Kehrer's patients were primiparæ, and 24% of Dorland's, while of the 100 cases reported by Dorland, 18%, or 23½% of the multiparæ, had aborted one or more times. The previous condition of health seems to have exerted little, if any, influence upon the development of the chorionic disease. Nausea and vomiting are not especially prominent in the disease, while fully half of the women suffer from anemia and debility to a marked degree; and this is probably due to the hemorrhages from which they suffer. Renal insufficiency, or the kidney of pregnancy, is at least three times as frequent in this condition as in normal gestation, probably the result of the excessive pressure

[1] Canad. Pract., Mar., 1896.
[2] Wien. med. Woch., Mar. 7, 1896.
[3] Univ. Med. Mag., May, 1896.
[4] Practitioner, 1896, No. 1.

upon the renal veins. Abdominal pain was a marked symptom in 38% of the cases toward the close of the gestation. It is probable that the origin of this pain is the extreme and rapid development of the uterine tumor which was noted in 85% of the cases. Absence of the uterine souffle is the rule. A number of the women claimed to have felt fetal movements. Uterine hemorrhage is a constant symptom, generally commencing about the second or third month, and at times partaking rather of the nature of a watery or sanguineous discharge than of a true hemorrhage; 63% of the births occurred from the third to the fifth month, inclusive, as compared with 74% in Kehrer's table. 3% of Dorland's cases arrived at term, while Kehrer showed a percentage of 4. In 6% of the cases an embryo or fetus either preceded or followed the discharge of the mass. There is a great tendency to the manifestation of septic intoxication after the delivery of an hydatidiform mole. In 31%, or nearly one-third of the cases, was a certain degree of sepsis recorded; 10% mortality is noted, half of this number perishing from septic infection.

[The relationship existing between cystic disease of the chorion and deciduoma malignum is becoming more clearly defined, and, next to the revival of symphysiotomy, this is the subject that has recently excited most interest in the obstetric world. This newly-recognized neoplasm is a malignant growth from the pregnant or recently pregnant womb. There may have been a recent normal delivery at term or an abortion, or particularly a hydatid mole. The first symptoms are repeated hemorrhage and offensive discharge; then a friable growth can be detected on intrauterine exploration, especially at the placental site; macroscopically the growth resembles placental débris. Anemia, weakness, and cachexia supervene; metastatic deposits occur in other organs, especially in the lungs, and septic symptoms are present. The disease runs a rapid course, and early and complete extirpation of the womb is the only available treatment. The new growth is especially characterized by the presence of certain very large cells, with large nuclei, that bear some resemblance to the large cells of myeloid sarcoma, but that also resemble the so-called "decidual cells" of normal pregnancy.] Papers on the subject have been presented by Bacon,[1] Marchand,[2] Nové-Josserand and Lacroix,[3] Resinelli,[4] Apfelstedt and Aschoff,[5] 2 cases; Champneys,[6] and Fränkel.[7] Bacon's and Champneys' cases resulted fatally without operative interference, as did also Marchand's and Resinelli's. Marchand has collected 15 cases of deciduoma malignum, and no less than 12 of malignant growths following the development of vesicular mole. Eleven died in less than 2 years after the vesicular mole was removed; in 1 there was no after-history beyond the 6th or 7th week, when the uterus contained deposits; in the remaining case the uterus was removed through the vagina, and 3 months later the patient was doing

[1] Am. Jour. Obst., May, 1895. [2] Monatsh. f. Geburtsh. u. Gynäk., June, 1895.
[3] Ann. de Gynéc. et d'Obstét., 1895, vol. i. p. 105.
[4] Gaz. Hebdom. de Méd. et de Chir., Apr., 1896.
[5] Arch. f. Gynäk., 1896, Bd. i. H. 3. [6] Practitioner, No. 1, 1896.
[7] Arch. f. Gynäk., Bd. xlix. H. 3, 1895.

well. Marchand concludes that malignant deciduoma differs in many ways from carcinoma, although it is of epithelial origin. Fränkel has investigated the changes that take place in the development of this tumor after cystic chorionic disease. He has found that the superficial epithelial layer, or syncytium, of the chorionic villi proliferates considerably when a vesicular mole develops, and it is from this abnormal development of epithelium that the malignant deciduoma is evolved. The deeper cellular investment of the chorionic villus, or Langhan's layer, according to Fränkel, takes no primary part in the development either of the mole or of the deciduoma. Freund[1] reported a case at a recent meeting of the Strassburg Medical Society. The patient, a tertipara, was confined normally in June, 1894. From this time she complained of small hemorrhages occurring daily and gradually becoming more profuse. Examination in June, 1895, revealed a placental polypus, which Freund removed. The growth was about the size of a plum, and had penetrated into the attenuated uterine wall. The polypus under microscopic examination proved to be mainly placental tissue. The bleeding ceased after the operation, but recurred in December of the same year. Examination of the uterus at this time showed a rapid growth of the organ, and at the expiration of 2 weeks it had attained the size of a 4-months' pregnant uterus. In addition, a small secondary tumor was found in the posterior vaginal wall of the nature of a deciduous sarcoma. Vaginal extirpation of the uterus was performed, the woman making a good recovery. Section of the uterus revealed a tumor, villous in character, about the size of an egg, at the site of the removed placental polypus. The villi were not of chorionic structure. Runge,[2] under the title malignant disease of the chorion, describes a malignant tumor of the chorionic villi, the origin of which could be traced to a previous hydatiform mole.

Singultus Fœtalis, or Fetal Hiccough.—Three cases of this curious condition are reported by DeLee[3] and 2 by Hink.[4] Fetal hiccoughs manifest themselves by rhythmic tapping movements in the neighborhood of the fetal shoulders, recurring at irregular intervals. Hink, with the large material of the Vienna Obstetrical Clinic, has diagnosed these movements 7 times in 750 cases, some during pregnancy, others in labor, and can recall 6 other cases of a similar nature. He concludes that there is a variety of singultus without the passage of air through the glottis, and that, therefore, this phenomenon can occur *in utero*; secondly, that the action is unattended with any other noise than the striking of the shoulders against the uterine wall, which produces the jarring and the characteristic short dull tone. No pathologic significance can be attached to the phenomenon. It is not difficult to distinguish this movement from other fetal movements. The position over the back and shoulders and the regular recurrence exclude movements of the extremities and stretching of the back; the frequency, about every 4 seconds, excludes fetal or maternal pulse; while the suddenness of the motion, its jerking character, and the production of a short sound, distinguish it from partial contraction of the uterine

[1] Am. Jour. Obst., June, 1896.
[2] Arch. f. Gynäk., Bd. li. H. 1.
[3] Chicago Med. Recorder, Aug., 1895.
[4] Centralbl. f. Gynäk., No. 5, 1895.

or abdominal muscle. It has been observed as early as the seventh month and up to and during labor.

Vagitus Uterinus.—Flatau[1] has reported a case of a quartipara, at the normal end of an uncomplicated pregnancy, in whom the onset of labor was marked by copious hemorrhage. Placenta prævia lateralis was diagnosticated, and in the hope that the head would descend and act as a tampon, the membranes were ruptured through the partially dilated os uteri. The anticipated result was not realized, and a tampon of iodoform-gauze became necessary. The hemorrhage, however, persisted, and podalic version was performed. With the outer hand grasping the head, an attempt was made with two fingers introduced into the uterus to bring the feet together. In the performance of this act the umbilical cord was compressed, and at once cries were heard. These were repeated when the cord was again compressed. Version was finally effected successfully, and the child at once extracted. The infant was asphyxiated, but was resuscitated by mechanical irritation of the precordium. [The explanation offered for the phenomenon observed is, that air was introduced into the uterus with the hand, and that compression of the cord induced dyspnea, with the resultant cry on the part of the fetus.]

Fetal Traumatism and Death.—An interesting case of intrauterine rupture of the anterior abdominal wall of the fetus, dependent upon some



FIG. 100.—Pygopagus (Jacobi and Tynberg).

unnoticed maternal traumatism, is reported by Brothers.[2] There was associated an absence of genitals and anus, together with an exstrophy of the bladder. The child lived for 25 hours, the napkins showing that urine was secreted.

[1] Centralbl. f. Gynäk., 1896, No. 11, p. 293.

[2] N. Y. Med. Jour., Dec. 7, 1895.

Freiberg[1] reports an intrauterine fracture of the tibia in a child belonging to a family in which other abnormalities in the skeleton had been observed. He remarks that 50% of reported intrauterine fractures are those of the leg, while but a small number are in the region of the lower epiphysis. Westphalen[2] reports 2 cases of fetal death during the last months of pregnancy from direct violence. Vicarella[3] regards the presence of acetone in the urine during pregnancy as a new and valuable sign of fetal death, provided other causes of acetone can be excluded. In an examination of 139 pregnant women he found 9 cases of acetone in the urine. In each of these cases the woman was carrying a dead fetus. In 1 case of hydramnion all the clinical symptoms of a dead fetus were present, but the urine contained no acetone. The woman was subsequently delivered of a living child. [The presence of the acetone is explained by the absorption of partly oxidized albumin from a macerated fetus.]



FIG. 101.—Acephalic omphalosite (Nammack).

Fetal Monstrosities.—In treating of the etiology of monstrosities, Ballantyne[4] gives the following classification of the various theories that have from time to time been advanced: A. Theories of the Past: 1. Supernatural Causes; 2. Physical Causes; 3. Mental Influence. B. Theories of the Present: 1. Mechanical Causes; 2. Diseases of—(*a*) Fetus; (*b*) Fetal Annexa; 3. Embryologic and Germinal States; (*a*) Heredity and Atavism; (*b*) Environment; (*c*) Germ Infection. Remarkable cases of fetal monsters are recorded as follows: Onuf,[5] a case of double formation of the face with cranio-rachischisis involving the whole vertebral column; there were

[1] Ann. of Surg., vol. xxii. No. 6, 1895.
[2] Monats. f. Geburtsh. u. Gynäk, Bd. ii. H. 3, 1895.
[3] Wien. med. Presse, 1894, p. 205.
[4] Edinb. Med. Jour., Jan., 1896.
[5] Med. Rec., Sept. 21, 1895.

present two pharynges, which communicated with each other; an osseous sternum was absent; Kempe,[1] a case of thoracopagous male twins with a common heart, and a transposition of the viscera in one twin; there was one placenta and only one umbilical cord. Playfair mentions 19 such cases as having been recorded; A. Jacobi and S. Tynberg,[2] a case of pygopagus, the fourteenth on record, the children surviving 5 months; the placenta was single, also the cord, which divided into branches 2 inches from its velamentous insertion: an illustration is appended (Fig. 100); Conklin,[3] a pseudencephalic monster, supposed to be the result of a pronounced maternal impression; Nammack,[4] an acephalic omphalosite (Fig. 101), one fetus seeming to have undergone a normal development for 5 months, while the parasite presented a curious instance of malformation and arrested development; a coexisting cyst (hydrencephalocele, springing

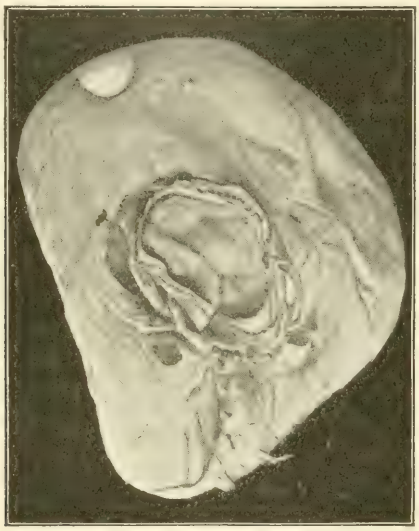


FIG. 102.—Fœtus amorphus (Hirst).

from the root of the nose) was also present; the parasite was a shapeless mass, to which was appended one well-formed foot with 7 toes; the other lower extremity was rudimentary; Hirst,[5] a typical case of fœtus amorphus or anideus (Fig. 102), the lowest form of omphalosite, the parasitic fetus being reduced to a shapeless mass of flesh covered with skin; the host in this case was a normal, well-developed child, born alive at full term; Richard H. Wood,[6] Perkins,[7] A. C. Wood,[8] W. A. Wood,[9] and Bowerman,[10] cases of anencephalous monsters; Craig,[11] a case of complete absence of the upper half of the frontal, the entire parietal, and upper half of the occipital bones, together with the hair and scalp; there was also a cleft palate; the child died on the third day of acute

[1] Brit. Med. Jour., Dec. 7, 1895.
[2] Arch. of Ped., Oct., 1895.
[3] Buffalo Med. Jour., Mar., 1896.
[4] N. Y. Med. Jour., July 20, 1895.
[5] Univ. Med. Mag., Nov., 1895.
[6] Med. Rec., Dec. 21, 1895.
[7] Med. Rec., Oct. 5, 1895.
[8] Univ. Med. Mag., Sept., 1896.
[9] Intercol. Med. Jour. of Austral., June 20, 1896.
[10] Med. Rec., Aug. 31, 1895.
[11] Lancet, Feb. 8, 1896.

meningitis; W. Reynolds Wilson,[1] a case of congenital malformation due to thickening of the integument (especially of the muscular tissue), complicating spina bifida; Stone,[2] a case of congenital deficiency of the posterior portion of the diaphragm, with the abdominal viscera resting in the thorax; Todd,[3] a case of fetal ectopy of the liver, omentum, and bladder; and Langran,[4] a case of supernumerary fingers. Haven[5] records a case of kynocephalous monster. The mother, Mrs. D———, was since early childhood possessed with a great fear of even the picture of a dog, the result of a so-called maternal impression, the history being that her mother had been frightened by a dog while carrying her daughter *in utero*. Mrs. D———, during the sixth week of pregnancy, had been herself frightened by a dog, and firmly believed that her child would be marked like a dog. Some time later she was jumped upon and bitten by the same dog, and immediately gave birth prematurely to the monster, whose head was precisely similar in shape to that of the dog.

THE PATHOLOGY OF PREGNANCY.

The Pernicious Vomiting of Pregnancy.—Cases of this disease are recorded by Pureh,[6] Larat,[7] Lee,[8] Bar and Bienfait,[9] and Charpentier.[10] Pureh was compelled to terminate the gestation in his case—a hysteroneurasthenic subject—by the use of the curet at the sixth week, the vomiting ceasing immediately. Gaulard believes that palliatives should be tried until there is a rise of temperature, which he regards as a dangerous symptom; while, on the contrary, Charpentier states that he is now in favor of terminating the pregnancy as early as possible. He does this by introducing into the uterus a short stick of solid silver nitrate, which is left to melt there. [This is an unnecessary and unsafe procedure; the usual antiseptic method of inducing abortion is safe and applicable in every instance.] Disproportion between pulse and temperature is a grave symptom in this disease. Marduel[11] relates an interesting case that resulted fatally 1 month after the induction of abortion. Bar and Bienfait claim good results from faradization of the vagi before or after meals, while Larat has also employed successfully the constant current, the positive pole being placed on the neck over the point of emergence of the right pneumogastric nerve, and the negative pole to the epigastrium. [This method of treatment needs to be tested much more extensively before its real therapeutic value can be determined.] Audebert[12] believes that when it becomes necessary to empty the uterus in the early months of pregnancy because of uncontrollable vomiting, dilatation of the cervix by Hegar's dilators, followed by curettage, is the best and most effective method to employ.

Valvular Cardiac Disease.—This grave and important complication of

[1] Am. Jour. Obst., Jan., 1896.
[2] Austral. Med. Jour., Dec. 20, 1895.
[3] Lancet, July 20, 1895.
[4] Ibid., Mar. 7, 1896.
[5] Jour. Am. Med. Assoc., Feb. 29, 1896.
[6] Méd moderne, May 11, 1895.
[7] Bull. et Mém. de la Soc. Obst. et Gynéc. de Paris, No. 8, 1895.
[8] New Orl. M. and S. Jour., July, 1895.
[9] Jour. de Méd. de Paris, Nov. 17, 1895.
[10] Ibid., Oct. 27, 1895.
[11] Méd. mod., May 1, 1895.
[12] Congrès de Gynéc. de Bordeaux, Aug., 1895.

pregnancy has attracted the attention of many obstetricians of late. Probably the most exhaustive contribution on the subject is that of Handfield-Jones.[1] He remarks that failure of the ventricle has a distinct effect upon the course of pregnancy. In the early months it leads to abortion, and in the later months to premature delivery. Porak confirms this point, and says that "heart troubles have an evident influence on pregnancy, by provoking metrorrhagias, by determining very often abortions or premature delivery, by producing, it may be, placental lesions, and by acting harmfully on the infant, which sometimes dies before its birth or is born under conditions not favorable to development and disposing toward premature death." The heart during pregnancy and the puerperium is specially liable to undergo fatty degeneration. This may be due to retrograde changes taking place after delivery, or may depend on the premature setting in of these changes, together with an insufficiently oxygenated state of the blood, dependent partly on anemia and partly on lung-disease. The condition of the muscular heart-wall is of more importance during pregnancy than the valvular lesion; many women with valvular lesions pass through their early pregnancies without any sign of heart-failure, but as the heart-muscle becomes deteriorated by the strain of repeated pregnancies they show increasing evidence of cardiac insufficiency. Of all the forms of valvular lesion, mitral stenosis of a marked degree is the most disastrous: this is largely due to the extra strain thrown in these cases on the pulmonary circulation and the right heart. The increased arterial tension, the increased volume of blood, and the increased development of the left ventricle, all tend to produce dilatation of the left auricle and of the right ventricle. The pulmonary circulation is thus kept continually congested, unless pronounced hypertrophy of the right ventricle takes place. At the close of delivery, when more blood collects in the right side of the heart, the risk is increased and the danger reaches its maximum. He further states that, provided a valvular lesion is well compensated and the muscular tissue of the heart can be judged to be sound, and provided also that the patient is a young woman in whom processes of repair may reasonably be expected to go on at a healthy rate, there would be no just reason for forbidding her to marry. If, however, there are any serious symptoms of cardiac disturbance present, or attacks of dyspnea, breathlessness, palpitation on exertion, or hemoptysis, marriage should not be sanctioned. Regarding the action of free bleeding during the third stage of labor, he earnestly bears testimony to its useful effect. A free loss tends to relieve the right heart from undue engorgement and considerably lessens the risk of sudden stoppage of the heart. Equally useful is the application of leeches over the liver or heart during the puerperium when blueness of the lips and face, with dyspnea and pulmonary trouble, indicate an overdistended and failing right ventricle. Of all drugs, strychnin and amyl nitrite are the most useful.

Rosenberg[2] specifies the earliest symptoms of the disturbed heart's action, as dyspnea, palpitation, edema of the face and extremities, and bronchitis, and advises the suspension of every exertion on the part of the patient, the recum-

[1] Lancet, Jan. 18, Jan. 25, Feb. 1, 1896.

[2] N. Y. Med. Jour., Jan. 18, 1896.

bent posture being retained during the greater part of the day. Frequent examination of the urine is indispensable, and a strict milk diet must follow the finding of the first trace of albumin. Cardiac stimulants are necessary. The induction of premature labor is often not followed by relief, the woman's condition being one of extreme peril from asystolism. Success can only be expected if the pregnancy be terminated before the onset of serious symptoms. During labor the patient should be placed in the half-sitting posture, and alcoholic stimulants, camphor, strychnin, and strophanthus given; the nitrites are indicated whenever the pulmonary circulation becomes embarrassed. The main indication is to deliver as soon as possible. During the puerperium rest, simple diet, and appropriate stimulants form the rational basis of treatment. Hirst,[1] in addition to the heart-tonics already mentioned, gives his patients iron in full doses. During labor he deeply incises the cervix on all four sides to facilitate forceps-delivery and to favor loss of blood. As soon as practicable a large pad above the umbilicus and a tight binder should be applied to compensate for the sudden diminution of intraabdominal pressure. Phillips[2] states that these patients are especially liable to septic infection. Dorland has met with a case, hitherto unreported, of a young woman, 24 years of age, in the eighth month of pregnancy, with marked symptoms of cardiac failure the result of a mitral stenosis. There were intense dyspnea, hemoptysis, palpitation, and strong pulsation of the cervical vessels. During his absence from the city the patient fell into labor, was delivered of a living child, but died suddenly 9 hours later. Phillips[3] reports 4 cases—1 of aortic stenosis, 2 of mitral disease, and 1 of chronic mitral disease—in which labor was followed by acute endocarditis with regurgitation and death; Macé,[4] 2 fatal cases; and Wessinger,[5] 2 cases terminating fatally.

Pregnancy and Exophthalmic Goiter.—Signier[6] reports a case in which exophthalmic goiter began with a pregnancy, the symptoms ameliorating after delivery. He believes that the pregnancy was really the cause of the enlargement of the thyroid gland. Possibly the diminution in its size after parturition depended on some temporary condition in connection with the puerperium. Even so simple a cause as the necessary rest may explain the favorable change, which, after all, may not prove permanent.

Albuminuria and Nephritis in Pregnancy.—Gossmann[7] denies that the albuminuria of pregnancy always ends in the chronic form. He refers to the case of one patient who had acute nephritis during 8 pregnancies, and yet was always free from kidney-symptoms when not pregnant. He induced labor without difficulty by means of vaginal douches, and used this means alone in 2 cases. Grimsdale[8] records a case of albuminuria and general anasarca of the mother during pregnancy, associated with general edema of the fetus and fluid distention of the fetal abdomen and hypertrophy of the placenta. In

[1] Canad. Pract., July, 1895. [2] Practitioner, June, 1895. [3] Loc. cit.
[4] Jour. de Méd. de Paris, Mar. 15, 1896. [5] N. Y. Med. Jour., Feb. 22, 1896.
[6] Répertoire univers. d'Obstét. et de Gynéc., June 25, 1895.
[7] Münch. med. Woch., June 25, 1895. [8] Liverpool Med.-Chir. Jour., Jan., 1895.

this instance Grimsdale believed that the disease was primarily fetal, the course of events being disease of the fetal liver and kidneys, causing general dropsy and ascites of the fetus and hydramnios, and secondary to these appeared the maternal nephritis. Brinton[1] makes the astonishing statement that "experience and statistics prove that women who have chronic nephritis conceive and carry their children to full terms without having convulsions. Indeed, it seems that if they do not abort they are less liable to eclampsia than women who for the first time develop kidney-disease during pregnancy." [In strong contradistinction to the foregoing we have the positive statement of such an authority as Tyson that unless the pregnancy be prematurely terminated it will inevitably result fatally. Such has been his experience, and such has been the experience of other men of equal standing. We strongly urge the extreme gravity of the condition, and moreover would add that women suffering from chronic nephritis develop grave manifestations at least 2 or 3 months earlier in gestation than those women in whom the renal inadequacy develops during the course of the gestation.]

Pregnancy and Diabetes.—Partridge[2] contributes a paper based on a study of 25 cases of this disease complicating the pregnant state. About one-half of these acquired diabetes during pregnancy, the other half already having the disease before pregnancy occurred. In the former class recovery took place in about three-fourths, with, however, an exhibition of a tendency to recurrence in a subsequent pregnancy. In the class in which pregnancy occurred in women already subjects of diabetes safety through delivery and the lying-in period was apparent in about two-thirds of the cases. Death of the fetus is noticed in about one-half of the cases. Premature delivery is observed in a large proportion of the reported cases, due to the presence of the dead fetus rather than to the direct influence of diabetes. There were 6 deaths in coma or collapse during or near the time of labor—1 in a woman who had diabetes before gestation, while 5 were in patients who acquired the disease during pregnancy. As to treatment by the artificial interruption of pregnancy, Partridge concludes that each case must be considered by itself. In a case of long history, with attacks of threatened coma or collapse, the indication for abortion seems plain. In the absence of these critical symptoms by dietetic and other treatment we rarely fail to obtain some improvement, and more radical measures are unnecessary.

Mental Disease in Pregnancy.—In writing upon puerperal insanity Dagonet[3] states that the puerperal condition, properly speaking, refers only to the functional and organic modifications that take place in women during and after parturition, before the return of the menses or the physiologic establishment of lactation. But from the point of view of puerperal insanity this period may be divided into three periods: (1) gestation; (2) puerperal conditions proper; (3) lactation. The following statistics show the relative frequency of psychosis in each of these periods: gestation, 3.1 in 100; puerperal condition proper, 9.2 in

[1] New Orl. M. and S. Jour. Jan., 1896. [2] Med. Rec., July, 27, 1895.
[3] Progrès méd., Apr. 7, 1894.

100; lactation, 3.6 in 100. According to Macé, insanity caused by pregnancy generally develops about the end of the fourth month, and increases progressively. Melancholia is the most frequent form. Schmidt gives the following proportions: 52.9 in 100, melancholia; 31.3 in 100, mania; 10.3 in 100, systematized delirium; 5.8 in 100, general paralytic dementia. Macé observes that labor seldom relieves this form of mental disease; on the contrary, the symptoms are generally aggravated, and melancholia often assumes the form of more or less violent mania. Abortion, sometimes recommended as a curative measure, should be strictly forbidden. Gestation, with these patients, is usually normal, and abortion seldom occurs spontaneously. The opinion advanced by some authors that pregnancy exerts a beneficial influence upon insanity already established is not sustained by statistics. Esquirol believes that marriage and labor generally stimulate the disease. When the psychosis appears at an early period the prognosis is more favorable than when it occurs toward the end of gestation, but it generally persists for several months, and relapses may be expected in subsequent pregnancies. The causes of puerperal insanity proper —that is, insanity that develops during the period following labor before the the organs of generation have resumed their normal functions—are divided by Campbell-Clark into predisposing causes and producing causes. In the first category hereditary predisposition is the most important, as it exists in 56% of these cases. The complicated influences affecting a first pregnancy are next in order. Nearly half the patients suffering from this form of psychosis are primiparæ. Among producing causes infection occupies the first rank—infection of the uterus or of other organs. Campbell-Clark reports 70 of 100 cases caused by infection—66 by infection of the uterus, 4 of the kidneys. More than half these patients were under the influence of intense moral emotions; and we realize the importance of this influence when we consider the large number of women who suffer from puerperal infection. Dr. Idanof gives the proportions as 8 or 9%, and the comparative variety of puerperal insanity. The disease usually appears about the fourth or fifth day. Irritability, insomnia, headache, agitation, diminished secretion of milk, are premonitory symptoms. Fever may or may not be present, but the head is always hot. Sometimes the disease assumes a fatal form, when the tongue becomes dry and furred, the secretions cease abruptly, and the patient falls into a comatose state, which soon ends in death. Puerperal insanity proper assumes the most diverse forms: mania in 48.7%; melancholia in 37.9%; systematized delirium in 5.8%; acute dementia in 5.5%. The prognosis is favorable in most cases, more favorable in mania than in melancholia. Patients suffering from insanity after prolonged lactation usually present symptoms of extreme exhaustion. The prognosis here is not unfavorable, but more grave than in puerperal insanity proper. The therapeutic indications are the same in all kinds of puerperal insanity. Treatment consists in the removal of all exciting causes, a tonic régimen, mild purgatives, injections of chloral hydrate, and other soothing influences. Valenta[1] reports the case of a primigravida of bad hereditary history who became

[1] Arch. f. Gynäk., Bd. xlix. H. 1, 1895.

excessively hysterical when she discovered that she was in a pregnant condition; her paroxysms resembled those called clownish hysteria. She became so weakened and emaciated by the disorder that it was necessary to empty the uterus. As soon as the membranes were ruptured and the amniotic liquid escaped there was a marked improvement in the patient's condition. Barbour[1] records the case of a single primigravida, aged 20, who was well during pregnancy until fetal movements developed; she was then seized with attacks of hysteric paralysis that produced a condition closely resembling dementia. Muscular contractures with areas of anesthesia developed. Labor came on spontaneously, with epileptiform spasms with each pain, fever, and rapid pulse. The fetus died during the labor, and, the mother's pulse failing, delivery was completed by forceps. From the moment when the membranes ruptured the temperature declined, becoming normal; the paralysis disappeared, but the impairment of sensation and contractures remained. Temporary improvement followed the labor, with return of sleep and appetite. The patient, however, again failed, and died with high temperature. Postmortem examination showed thickening of the membranes of the brain, with softening on the right side, involving the internal capsule and extending to the base. The body of the fetus showed the same contractures that the mother exhibited, including a peculiar attitude of the right arm and hand. This was not due to rigor mortis, but was proved by dissection to be due to muscular contraction.

Pregnancy and Infectious Diseases.—Van der Willigen[2] in closely observing 432 cases of small-pox in women under 50 years, made particular note of 80 who were pregnant. Of these 15% died, while the mortality of the nonpregnant cases was 11.08%. Van der Willigen, like some previous authorities, finds that pregnancy increases the predisposition of a patient to the graver forms of variola. In the 80 cases confluent small-pox was seen in 4 and the hemorrhagic form in 6 cases; all the 10 died. In the 352 nonpregnant cases the confluent form was observed in 3 and the hemorrhagic in 11 patients; 2 of the confluent cases recovered. Two pregnant women died of milder forms; of the total, 12, there died 5 undelivered, the most of the others very shortly after birth without any trace of puerperal infection. Of the primiparæ, 9% died, of the multiparæ, 17.25%; 6.25% of women attacked by small-pox early in pregnancy died, whilst the mortality of those who were infected later amounted to 20.83%. Abortion or premature delivery was noted in 23 of the 80 cases during the course of the attack of small-pox. In 6 the same took place after convalescence from the disease; 16 children were delivered alive in cases in which the small-pox was still in progress, 8 at term, and 8 prematurely; only 3 lived longer than 6 months. Several died of variola; 2 were clearly born with it.

Pregnancy and Tuberculosis.—Maragliano[3] asks the important question, Should pregnancy in tuberculous women be permitted to go to term? as a result of the following personal observations: In 835 phthisical patients the

[1] Edinb. Med. Jour., June, 1895. [2] Nederl. tijdschr. v. Geneesk., No. 11, 1895.
[3] Centralbl. f. Gynäk., No. 29, 1895.

onset of the pulmonary trouble dated from pregnancy or childbed in 226 cases. Similar observations in the cases of pregnant and nonpregnant phthisical women, conducted over an equal period of time (21 months), showed that among the former death occurred in 94%, and among the latter in 18%. In 42 pregnant women with circumscribed tuberculosis, only 3 cases remained stationary, while in 7 cases death occurred within 3 months after childbirth, in 9 cases within 3 to 6 months, in 10 cases between 6 and 9 months, and in 4 cases after the period of 1 year; finally, 9 women died in childbed.

Sepsis and Pregnancy.—Sepsis occurring during pregnancy is exceedingly rare. However, Bar and Renon[1] presented at the recent Congress at Bordeaux a clinical report of a case of *streptococcism* in pregnancy. A woman was admitted into the hospital suffering from high fever and about 8 months pregnant. She experienced occasional pains. Before any obstetric manipulations were performed some cervical secretion was removed for examination. Cultivations proved that the secretion contained the streptococcus. The labor was hastened on account of the illness of the patient. Specimens of the maternal placental blood were cultivated and colonies of pure streptococci were obtained. The child died before birth. Samples of its blood from the placenta, liver, and heart and fragments of the liver and lungs were cultivated. The cultures remained sterile. The mother died 53 hours after delivery, and pus was found in the parametrium. Bar and Renon maintain that the streptococcism provoked labor. Though the fetus succumbed, there is no evidence that the germs invaded the fetal organism through the placenta.

Gonorrhea and Pregnancy.—The clinical importance of gonorrhea during pregnancy, labor, and the puerperal state is the subject of a contribution by Fehling.[2] He has seldom found it necessary to treat urethritis occurring from this cause. The patient is directed to drink an abundance of water, and occasionally sodium salicylate or salol is given. In obstinate cases iodoform-bougies are placed within the urethra. When vulvitis and vaginitis are present, antiseptic injections produce good results. Normal saline solution and potassium permanganate are useful in the form of douches. Twice weekly Fehling is accustomed to pencil the mucosa with a 5 to 10% solution of silver nitrate, using iodoform as a powder. Absorbent cotton should be placed between the labia, or compresses wet in lead-water. When erosions are present upon the cervix, silver nitrate may be used with a camel's-hair pencil. Gonorrheal salpingitis is treated in the usual manner, by rest, counter-irritants, and morphin. Scarification of the neck of the uterus is sometimes practised when the pain is excessive. [The danger of the induction of abortion must be borne in mind, however.] Should it be necessary to induce labor in a patient having gonorrhea, it is well to douche the vagina with normal saline solution, or with an antiseptic if the infection be in an acute stage. In cases in which there have been erosion and catarrh of the cervix for a long time the tissues are rigid and dilatation is slow; douches are of value, and multiple incisions are

[1] Répertoire univers. de Obstét. et de Gynéc., Sept. 25, 1895.

[2] Münch. med. Woch., Dec. 3, 1895, No. 49.

often required in these cases. No alteration in the placenta has been observed in gonorrheal patients.

Uterine Displacements in Pregnancy.—Forbes and Reid[1] record a case of retention of from 60 to 70 ounces of urine from a retroverted gravid uterus, the vesical tumor simulating an ovarian cyst, while Burrage[2] records 8 cases of retrodeviation of the pregnant uterus, including a case of pregnancy in an incarcerated cornu and a case complicated by an ovarian tumor. A complete prolapse of a pregnant uterus at the fifth or sixth week is reported by Hundley.[3] The condition not being recognized, a sound was introduced into the uterine cavity and the cervix amputated at its vaginal attachment; the woman aborted the same evening. [It is quite possible to make a positive diagnosis of pregnancy at the sixth week with the uterus in its normal position, and, no doubt, had pregnancy been suspected in the present case some of its manifestations could have been readily discovered.]

Metritis and Endometritis.—Emmanuel and Wittkowski,[4] investigating 3 cases of endometritis during pregnancy, found numerous intracellular diplococci closely resembling gonococci in the true decidua in the first, and in the serotina in the second. These microorganisms did not stain by Gram's method. The subject of the first observation again suffered during a subsequent pregnancy from endometritis, probably contracted before conception, and aborted at the fourth month. The true decidua were greatly altered and thickened, and were strewn with small round cells, particularly abundant on the surface. In these cellular foci Emmanuel found long filaments made up of short bacilli, staining by Gram and Weigert's method and growing in agar-agar. This bacillus had many of the characteristics of the bacillus coli communis, but differed in its reaction to Gram's method. From these studies they conclude that this condition results from a previous chronic endometritis that becomes acute upon the supervention of pregnancy. Veit agrees with this conclusion, and calls attention to cases of myxoma of the chorion in which the decidua contains microorganisms. He does not believe, however, that the ovum is infected and infects the mother; but, on the contrary, that myxoma of the chorion is usually caused by endometritis that has existed prior to conception.

Cumston[5] does not regard parenchymatous metritis as so important a factor in the etiology of abortion as is endometritis. That form, however, arising from puerperal infection is very prone to induce an abortion should the woman conceive. Syphilitic metritis, also, is a not uncommon cause of abortion. Infectious metritis is a most virulent form of the disease, almost invariably resulting in death of the ovum and its ultimate discharge, and not infrequently in maternal death also. Should abortion be threatened under these circumstances, it should be facilitated in order to remove as much of the diseased material as possible.

[1] Intercol. Med. Jour. of Austral., Feb. 20, 1896.

[2] Boston M. and S. Jour., Apr. 18, 1895.

[3] Med. News, Sept. 7, 1895.

[4] Congress of Naturalists, etc., Sept. 24–30, 1894.

[5] Boston M. and S. Jour., Aug. 29, 1895.

Pregnancy complicated by Pelvic Suppuration.—Michie[1] records a series of interesting cases in which pus had formed during pregnancy within the pelvis. The first case was that of a middle-aged married woman, who was 4 months pregnant when she developed appendicitis, and was operated upon, a perforated appendix being removed, together with a concretion lying at the bottom of an abscess within the pelvis; the cavity was drained by an India-rubber tube; the patient recovered in 3 weeks, and went to term and bore a living child in spontaneous labor. The second was the case of a multipara who was seized several times before labor with peritonitis, which was worse after delivery; the abdomen was opened, and several pints of offensive pus were removed; the Fallopian tubes contained pus and the ovaries were soft, gangrenous, and almost black; the abdomen was flushed with warm water and drained by a glass tube; the patient recovered. The third was the case of a primipara 6 months pregnant, who fell off a chair, causing pain and tenderness in the abdomen; she miscarried 6 days later, and was attacked by peritonitis; abdominal section was performed and several pints of pus evacuated; the abdomen was drained with a glass tube, and the ovaries and tubes allowed to remain; the patient recovered and subsequently became pregnant. He then records the case of a young woman 4 months pregnant in whom the uterus was retroverted, while both tubes and ovaries were diseased; they were removed by abdominal section, the patient making a good recovery. He also reports a fatal case in a multipara aged 40 years, about 5 months pregnant; she had been kicked and abused by a drunken husband; on examination, peritonitis was present and pregnancy was observed; at operation the pelvis contained a half-pint of seropurulent fluid, with double pyosalpinx. The abdomen was flushed with warm water and a rubber drainage-tube inserted; on the third day miscarriage occurred, followed by death on the sixth day from septic peritonitis. Finally, he reports an interesting case of a multigravida who was 3 months pregnant. On examination an ovarian cyst was diagnosticated complicating the pregnancy; labor-pains came on, with fever and high pulse; delivery was impossible, as the pelvis was blocked by the tumor; accordingly, the abdomen was opened, and an adherent ovarian cyst containing fetid pus was removed from the right side. No drainage was employed. Shortly after the operation the patient's abdomen became distended, and it was necessary to insert a glass drainage-tube; improvement followed and the tube was removed, but had to be reinserted; the patient made a good recovery. She afterward presented herself for treatment, suffering from retroversion of the uterus; there was also found an enlarged and cystic ovary, which was removed by abdominal section. Upon reopening the abdomen, the adhesions which had been found at the first operation had entirely disappeared.

Pregnancy in a Double Uterus.—Interesting cases are recorded as follows: Wendling,[2] a case of double uterus, with repeated hemorrhages from one uterus and pregnancy in the other, the patient being 20 years of age and single. The upper part of the vagina was divided by a thin septum, with a

[1] Prov. Med. Jour., July 1, 1895.

[2] Wien. klin. Woch., No. 2, 1896.

cervix on either side; Eustache,[1] the case of a woman pregnant for the second time and affected with leukorrhea since her first confinement. An examination revealed a double os, one closed and the other dilated, with a flow of mucopus from the latter. The left uterus was pregnant, and pregnancy advanced to term. Three days after the labor the patient experienced pain in the right half of the abdomen, and expelled a triangular membrane 4 cm. in diameter, this being evidently the caduca formed in the right uterine cavity. Three successive pregnancies have since occurred alternately in the right and left segments; each labor was followed on the third or fourth day by the expulsion of membranes from the nongestating cavity; Matveïff,[2] the case of a primipara confined at the beginning of the ninth month; a small fetus (weighing 1500 grams) was expelled from the right side of a double uterus; and Goulligod,[3] a case of abortion in a bifid uterus the seat of a double pregnancy; the right side aborted, and several hours later a fetus of 3½ months was expelled from the left side. Ameiss[4] records a case of uterus didelphys and vagina duplex in a woman of 24 years who had been married 5 weeks. Her menstrual history had always been regular since puberty at 15, but coitus was rendered impossible by the vaginal septum—a membranomuscular band which stretched across the middle of the vaginal orifice in an anteroposterior direction, dividing the introitus into two orifices. The left vagina, 7½ cm. long, was wider than the right, although much below the normal in size; the right vagina was 9 cm. long; the two uteri were distinct, each being movable separately and being in a latero-retroverted position. The left ovary was of about normal size, but rather close to the uterus; the right ovary was but a small, thickened nodule adherent to the uterus. The vaginal septum was removed by operation, and 3 months later the woman became pregnant in the left uterus. Pfannenstiel of Breslau, in a paper read before the German Gynecological Society at Vienna in 1894, tabulated 18 cases of pregnancy in uterus didelphys, 12 of which were delivered at full term, some a number of times; in most of these cases no trouble occurred during labor. The menstrual history in these cases is of interest. In a case recorded by Sprigg[5] examination showed that the flow emanated one month from one uterus and the next month from the other. Uterus didelphys is not as rare an occurrence as was formerly believed. In discussing Ameiss's paper, Tuholske reported the fourteenth case on record of pregnancy at full term in a uterus of this description. Being called in as a consultant, he was informed that a foot was presenting, but on making an examination found a tightly closed os. Repeated examination, however, showed a double vagina and uterus didelphys, with a breech-presentation in one organ. The labor was tedious and the child was stillborn, but the woman made a good recovery. Subsequently the vaginal septum was removed, and the woman again conceived, passing through a normal pregnancy and labor.

Spontaneous Rupture of the Uterus.—Instances of this rare accident

[1] Jour. des Sci. méd. de Lille, No. 40, 1895.
[2] Gaz. des Hôp., July 6, 1895.
[3] Univ. Med. Jour., Aug., 1895.
[4] Am. Jour. Obst., May, 1896.
[5] Ibid.; July, 1895.

are recorded by Reynolds,[1] Doléris,[2] Chéron,[3] two cases, Marks,[4] and Townsend.[5] All the cases terminated fatally. In Marks' case gestation had advanced to the eighth month, and 2 perforations were found in the uterine wall near the fundus, while several nonperforating ulcerations were detected elsewhere. Townsend's case occurred during a normal labor without obstruction (save that due to the size of the child—13 pounds) in an enormously fat woman. There was a large transverse tear in the lower uterine segment involving the vagina and a portion of the bladder. Reynolds' patient was a stout alcoholic, weighing 240 pounds. The rent in this case involved the entire left side of the uterus from the cervix to the fundus. Doléris' patient was a woman 32 years of age, an alcoholic, who was markedly cachectic and in a quasi-scorbutic condition. Profuse hemorrhage occurred during labor, and, the condition of the child becoming alarming, version and extraction were performed, the child being delivered stillborn. The mother died several days postpartum without symptoms of peritonitis, and a postmortem examination revealed an extensive rupture of the lower uterine segment. A most remarkable feature of the case was the entire absence of shock. [In all of these cases the predisposing cause of the rupture was a fatty degeneration of the muscular fibers of the uterine wall, and it is probable that this is the cause of the accident in all instances not secondary to some abdominal operation.]

Traumatisms and Operations during Pregnancy.—An exceedingly interesting, and perhaps unique, case of bullet-wound of the pregnant uterus is recorded by Pritchard.[6] The patient was 7 months advanced in pregnancy, and had been shot with a revolver in the abdomen. She was admitted to the Bristol Infirmary 2½ hours afterward in a condition of collapse. The bullet entered 3 in. above and 2 in. in front of the right anterior superior spine (see Fig. 103). There was little hemorrhage and no great distention of the abdomen. The fetal heart was easily heard. A probe would not pass through the abdominal wall. There was no distinct evidence that the bullet had penetrated the abdomen. Later in the evening the bullet was found ½ in. above and 5 in. behind the left anterior superior spine, and was extracted under cocain. As

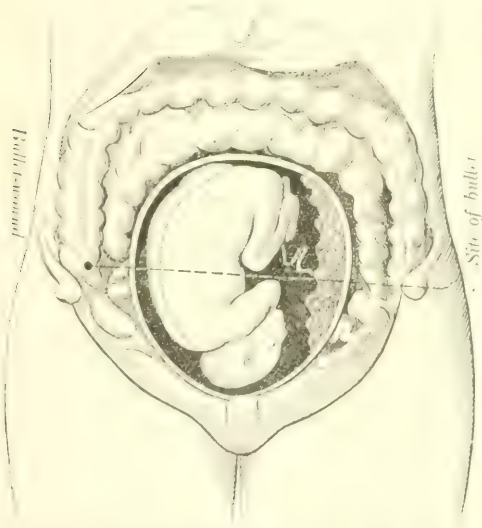


FIG. 103.—Pritchard's case (Brit. Med. Jour., Feb. 8, 1896).

[1] Boston M. and S. Jour., Jan. 16, 1896.
[2] Presse méd., Feb. 13, 1896.
[3] Jour. de méd. de Paris, May 10, 1896.
[4] Canada Med. Rec., Oct., 1895.
[5] Boston M. and S. Jour., Dec. 12, 1895.
[6] Brit. Med. Jour., Feb. 8, 1896.

the patient's pulse was increasing in quickness and the distention of the abdomen was greater, abdominal section was performed. The uterus was found to have been shot through, and accordingly was opened, and a dead fetus and placenta, both perforated by the bullet, were removed. The uterus was amputated, and the pedicle fixed outside the abdomen at the lower end of the wound. Three coils of small intestine had been perforated; these were closed with silk suture. An artery in the mesentery had been severed and required ligature. The peritoneal cavity was emptied of blood and clots, and thoroughly washed out with boric solution. Drainage with gauze and a glass tube was employed. The patient survived 6 days and 12 hours. She had bowel-movements, and a sanguineous fluid, which became purulent, was removed from the drainage-tube. At the autopsy death was found to have resulted from purulent peritonitis in three or four foci, the worst being inside the wound of exit. The intestines were completely sealed. The pedicle was also in good condition. The peritoneum had evidently become infected by the bullet after passing through the intestine. Examination of the body of the fetus showed that the shot passed through the pleura, diaphragm, and liver.

The Indian Med. Record, May 16, 1896, quotes the following case: "A remarkable case has recently been published in an Italian contemporary of a woman who, when 6 months pregnant, was stabbed twice in the abdomen. Both wounds penetrated the abdominal cavity, and, as there were signs of internal hemorrhage, the abdomen was immediately opened. The uterus was found to have been perforated in two places by the knife, and the wounds were closed by sutures, the hemorrhage being thus checked and the immediate danger removed. The patient progressed very well until the third day, when severe pains came on, and on the next day an abortion took place from which she completely recovered. The fetus was dead, and on being examined it was found that one stab had penetrated into the left side of its chest, and that another had wounded the small intestine in 2 places, purulent peritonitis having thus been set up. The case, we believe, is unique, and the fact that peritonitis from the intestinal wound had been caused in a 6 months' fetus is a clinical fact of the greatest interest."

Operations during Pregnancy.—A number of operations have been performed during the year for ovarian and uterine tumors complicating pregnancy. Hirst[1] records a rare case of dermoid cyst in pregnancy. In 2275 ovariotomies in general collected by Olshausen only 80 were for dermoid cysts —3.5%. In Dsirne's complete statistics of 135 operations for ovarian tumors in pregnancy there were 10 for dermoid cysts. Homans has since reported an operation, and Hirst's is the twelfth case on record. The tumor closely resembled an extrauterine pregnancy. Rubeska[2] reports the thirteenth case operated upon successfully; Staude,[3] the fourteenth; Delagénière (see below), the fifteenth; and Denny,[4] the sixteenth. Jetter has found that 19% of ovarian

[1] Am. Jour. Obst., Aug., 1895.
[2] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. ii. H. 3.
[3] Ibid., Bd. ii. H. 4, 1895.
[4] Boston M. and S. Jour., May 7, 1896.

tumors discovered during pregnancy are dermoids, while in other series of ovarian tumors found in those not pregnant but 4% are dermoids. Rosenfeld[1] records a 4 months' pregnancy complicated by a large vesical calculus in a woman 27 years of age. The calculus prevented the escape of urine, and operation was imperative. Abortion occurred 40 hours after the operation. The patient perished of pneumonia and heart-failure a few days after the performance of the operation.

Operations for ovarian cyst in pregnancy are recorded as follows: Merkel,[2] a successful bilateral ovariectomy; Mainzer,[3] the same; Breed,[4] a case of pregnancy complicated by ovarian cyst, but not operated upon until after delivery; Delagénière,[5] 3 successful cases, 1 a dermoid; Rubeska,[6] 2 successful cases; and Staude,[7] several cases, in 1 of which he was compelled to perform ovariotomy through the vagina during the actual progress of labor, probably the only case of the kind on record. [The general consensus of opinion is that ovarian tumors in pregnancy should be removed as soon as discovered; this does not necessarily mean the loss of the product of conception.]

Operations for fibromyomata and other uterine tumors complicating pregnancy are recorded by Elder,[8] Bernardy,[9] Cameron,[10] Leopold,[11] Fehling,[12] Hardon,[13] Frank,[14] Kelley (J. T.),[15] 2 cases, and Murphy.[16] Bernardy's and Fehling's cases were operated upon for carcinoma, the former at 4½ months and the latter at 7 months. Bernardy's case perished on the fourth day of heart-failure: the other cases all recovered. Frank's case is remarkable in that the tumor delivered itself spontaneously through an incision in the abdominal wall 3 weeks after the incision had been made. Rosenberg[17] records 4 cases of pregnancy complicated by fibroid tumors of the uterus varying in size from an orange to a fetal head. Operation was not required, each case being successfully delivered and passing through a normal puerperium. The tumors decreased rapidly after delivery in each case, and Rosenberg contends, in view of this experience, that myomectomy should never be performed during pregnancy unless some exigency arises. In speaking of fibroid tumor complicating pregnancy, Kelley[18] states that if the growth be situated above the cervix, two operations stand paramount—myomectomy and hysterectomy. Leopold[19] lauds the former and quotes statistics; he gives by this operation for the 10 years from 1884 to 1894 a maternal mortality of 17.4%, and 37.13% for the children. Rosenberg follows Leopold with a paper giving in detail 4 cases of noninterference that terminated favorably, and seems to think operation seldom necessary; but 2 of his cases were not recognized until after labor, and in the 2 others, 1 at

[1] Münch. med. Woch., No. 39, 1895.
[2] Ibid., Sept. 10, 1895, No. 37.
[3] Ibid., Nov. 26, 1895, No. 48.
[4] Ann. of Gyn. and Paed., Dec., 1895.
[5] Centralbl. f. Gynäk., No. 26, 1895.
[6] Loc. cit.
[7] Loc. cit.
[8] Med. Press and Circ., Feb. 26, 1896.
[9] Am. Gyn. and Obst. Jour., Nov., 1895.
[10] Brit. Med. Jour., Dec. 7, 1895.
[11] Am. Jour. Obst., May, 1895.
[12] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. ii. H. 5.
[13] Am. Jour. Obst., May, 1896.
[14] Atlanta M. and S. Jour., July, 1895.
[15] Ann. of Gyn. and Paed., Dec., 1895.
[16] Internat. Med. Mag., Feb., 1896.
[17] Am. Jour. Obst., May, 1895.
[18] Loc. cit.
[19] Loc. cit.

full term was only the size of an orange, and the other at 2 months was scarcely to be recognized. In Lafour's[1] statistics of 300 delivered by the natural passage there is a maternal mortality of 25–55%, and for the children 77%. Stavely[2] has collected 33 cases of myomectomy that show a maternal mortality of 8 deaths, or 24.25%; and, since 1889, 17 cases have been reported, with a mortality of 11.75%, showing that with improved methods of operating the operation is becoming less dangerous. This method can be employed when the tumor has a comparatively small base and is not adherent. Kelley reports 2 cases, 1 delivered at term with forceps, the patient almost perishing from postpartum hemorrhage due to a closely adherent placenta which was situated just over the site of the tumor, and the other having a hysterectomy performed at 2 months with a successful result. Crowell[3] (H. C.) reports a case of 3½ months' pregnancy complicated by a large fibroid successfully treated by hysterectomy, and a similar case is recorded by Ruth,[4] the patient perishing after the operation, her condition having been bad before its performance. In such a case he advises ligation of as much of the blood-supply as can be safely done without causing sloughing, and then closing the abdomen quickly; abortion should be produced later, and a final hysterectomy still later, if it seems indicated.

Missed Abortion.—Orloff[5] and König[6] report cases of so-called missed abortion. Orloff's patient had borne 10 children, and came to the clinic with a history of icterus and vomiting of blood. There was also enlargement of the abdomen, and puncture was made to relieve the pressure-symptoms. A diagnosis was made of cirrhosis of the liver, with intestinal hemorrhage. The patient shortly afterward died, and upon postmortem examination an impregnated ovum was found lying in the right horn of the uterus. The ovum had ruptured, and only the chorial sac remained. So far as the history and appearance of the tissues indicated, the ovum had remained for more than a year within the uterus. König's case was a woman 37 years of age, who advanced normally in the fifth pregnancy until the third month, at the expiration of which time the symptoms of gestation suddenly ceased, and the patient began to suffer from chilly sensations and from a feeling as if she were carrying a heavy weight in the abdomen. In addition she suffered from labor-like pains. Fourteen months later she expelled from the uterus an ovoid body 8 cm. long, which on close examination proved to be a fetus surrounded by amnion and blood-coagula. The menses then recurred regularly, and the woman regained her normal health.

Missed Labor.—[Prolongation of pregnancy is not an uncommon occurrence, but the two following cases are of exceptional interest.] Resnikow[7] records a multipara who had borne twins. While pregnant at a subsequent time she had a severe fever which lasted 2 months; during the first day of the

[1] Progrès méd., 1887.
[2] N. Y. Jour. of Gyn. and Obst., 1894, No. 5.
[3] Ann. Gynæc. and Pædiat., Mar., 1896.
[4] Ibid.
[5] Prager med. Woch., No. 22, 1895.
[6] Centralbl. f. Gynäk., 1894, No. 44.
[7] Ibid., No. 9, 1895.

disease she had labor-pains, but nothing came from the womb. Some time after this there began to be a discharge of pus from the vagina, and a year afterward with the pus bits of bone escaped. This persisted at intervals for 4 years, and the patient became very much emaciated. She had occasional attacks of high fever, and lost flesh and strength to a very marked degree. Menstruation did not return during the 4 years. Upon examination no evidence of inflammation about the pelvis was found; it was evident, however, that pieces of bone were contained within the uterine cavity. After suitable preparation the uterus was dilated with Hegar's dilators, iodoform-gauze tampons, and laminaria tents. Sufficient dilatation was secured to permit the extraction of the skeleton of a fetus of 7 months. The uterus was thoroughly disinfected, and the patient made a good recovery. It is supposed that during pregnancy the patient suffered from typhoid infection, which caused the death of the fetus and led to its subsequent suppuration. [This is a case of more than ordinary interest, embracing not only the prolongation of pregnancy far beyond term, but also showing the possibility of fetal infection from the mother.] Kahn[1] records a very interesting case of an octipara, 30 years of age, who was admitted to the hospital in Nov., 1894. Her menstrual history had always been normal, the last menses having occurred 11 months before. She believed herself to be pregnant, and stated that 5 months after her last period she had felt life for more than a month. At that time she contracted a severe cold, which developed into a peritonitis that persisted for some weeks. After this attack she ceased to feel life. During the 5 weeks prior to her entrance into the hospital she complained of a stinking vaginal discharge which contained shreds of tissue, but no bones. Her general condition on admission was very poor. Her pulse was rapid and her temperature ranged between normal and 102° F.; the urine was albuminous. In the abdomen palpation revealed a painful tumor that extended for 2 fingers' breadth above the umbilicus. The cervix was situated high up and was hard to the touch; the os admitted 1 finger. The intrauterine sound encountered a hard mass. After thorough disinfection of the vaginal canal, a strip of iodoform-gauze was introduced into the cervix, and this procedure was repeated daily for 5 days. The patient was then etherized, the cervix dilated manually, and an entire fetal skeleton (5 months old) was removed from the uterine cavity; the soft structure of the fetus and the placenta had entirely disappeared. Intrauterine irrigation was made with lysol and the cavity tamponed with iodoform-gauze. Although the uterus rapidly decreased in size, the general condition of the patient did not improve, and she died 3 weeks later of septic infection. [The usual history of these rare and interesting cases is about as in the foregoing instance. So long as the atmospheric germs do not gain entrance to the uterine cavity, the woman does not experience any inconvenience other than that incumbent upon the presence of an abdominal tumor. When the germs ultimately find entrance to the amniotic sac, a rapid disintegration of the tissues occurs, and the woman is subjected to all of the risks of septic intoxication.] F. A. Stahl[2]

[1] St. Petersburg. med. Woch., No. 2, 1896.

[2] N. Am. Pract., Aug., 1895.

reports a case in which he induced labor 302 days after the last menstrual period. When at term, labor-pains had set in, and for 3 hours were strong and regular; they then gradually died away. At the time of delivery the perineum was badly torn, owing to the great size of the fetal head. Ossification of the cranial bones had advanced very far, and made the parts incompressible. The fetus weighed 12 lb. 8 oz., the placenta and membranes 2 lb. The measurements of the head were: occipitofrontal diameter, 15 cm.; biparietal, 13½ cm.; bitemporal, 12 cm.; occipitofrontal circumference, 41 cm. The mother made a good recovery. [That a head of such dimensions could be delivered at all without primary perforation is a noteworthy point.]

Accidental Hemorrhage.—Cases of premature detachment of the placenta are reported by O'Gorman [1] and Blackwood.[2] Both fetuses perished, but the mothers recovered. O'Gorman's case was in the seventh month of gestation, and Blackwood's case in the ninth month. [Nothing is stated in either case as to the probable cause of the separation, whether due to fatty degeneration of the tissues or to traumatism.]

Placenta Prævia.—Interesting cases are recorded as follows: Long,[3] a multipara in the seventh month of the tenth pregnancy, in whom, after removal of the placenta centrally situated, an acute inversion of the uterus was discovered; this was replaced manually, and an uneventful recovery followed; Brindeau,[4] a case of spontaneous delivery of a living child through a centrally implanted placenta. The woman was in the seventh month of her fourth pregnancy, and no bleeding occurred during the delivery; some moments later, however, a free hemorrhage occurred, and the placenta was then found attached to the lower uterine segment close to the cervical opening all around; on removing it there was found an opening 6 inches in diameter in the center of the placental tissue, through which the child had escaped; Bayliss,[5] a case of partial placenta prævia; Stanton,[6] 1 case of partial and 2 of central implantation; Shaw,[7] 2 cases of central implantation treated by Champetier de Ribes' bag, both fetuses perishing; Noer,[8] 4 cases, the child surviving in 1 instance; Cree,[9] 2 cases of partial and 1 of complete placenta prævia, the child being dead in the last case; Nijhoff,[10] 1 case of central implantation, the child surviving; and Boss,[11] 133 cases that occurred between April, 1884, and April, 1894, in two institutions in Breslau. In one of the hospitals the proportion of placenta prævia to normal labor was 1 in 216, in the other 1 in 42—a remarkable difference. In 27.9% the placenta was central, in 61.6 lateral, in 10.5 marginal. The percentages of presentations were as follows: head 66.2, breech 1.8, footling 8, and transverse 24. Of the total 133 mothers, 8 died—5 from the direct effect of loss of blood, and 3 from fever or exhaustion after the first week; 27% of the children were born alive. As for management, the tampon, with

[1] Med. Press and Circ., Mar. 4, 1896.
[2] Edinb. Med. Jour., Oct., 1895.
[3] Am. Jour. Obst., Jan., 1896.
[4] Arch. de Tocol. et de Gynéc., No. 9, 1895.
[5] Lancet, Jan. 11, 1896.
[6] Buffalo Med. Jour., May, 1896.
[7] Ann. Gynæc. and Pædiat., Sept., 1895.
[8] Med. News, Apr. 18, 1896.
[9] Physician and Surgeon, Oct., 1895.
[10] Centralbl. f. Gynäk., No. 8, 1895.
[11] Ibid., No. 35, 1895.

the expectant treatment, was applied in 7 cases, rupture of the membranes with forceps in 9, forced labor in 1, and combined version in 115; in this latter category all the maternal deaths occurred. The cases, however, in which combined version was employed were all severe. One patient died from air in the veins 9 hours after labor.

Demelin[1] divides hemorrhage from faulty attachment of the placenta into 3 varieties. In the first labor has not begun. Here, if the flooding has been slight and has ceased, a skilled nurse should be constantly at hand ready with the tampon. When no assistance of this kind is available, the uterus should at once be emptied if the patient be strong with a good pulse. If she be weak from the hemorrhage, and therefore unable to bear so active a measure, the tampon should be introduced and maintained till the patient be stronger. In about 6 or 8 hours, as a rule, forcible delivery will be safe to perform. In the second class of cases labor has set in, but the cervix is but incompletely dilated. Then in lateral or marginal insertion of the placenta the membranes should simply be well opened if the vertex present and be well engaged. This maneuver is dangerous if the pelvis be contracted. In breech presentation, well engaged, one foot must be drawn down through the rent in the membranes. In any other presentation, or when the vertex or breech is prevented from coming well down, the dilating bag should be employed after rupture of the membranes, as the presenting part cannot in such a case press strongly enough on the bleeding surface. The tampon may also be needed. In complete placenta prævia, when the cervix is not fully dilated, the placenta should be perforated and the cervix dilated with the bags, the fetus being rapidly delivered if the patient be still strong. When she is weak and the pulse failing, the tampon must be applied till she has regained strength. If suddenly the child and the tampon are delivered together, so much the better. There remains the third class of cases. Here labor has set in and the cervix is completely dilated. To turn and deliver at once, or to deliver with the forceps if the head be well engaged, is the right course unless the patient be very weak from hemorrhage. In such a case, as before dilatation or labor, the tampon should be used. The head must be lowered, the extremities bandaged, and warmth applied. Rapid delivery must be effected, under ether, directly the patient has regained sufficient strength.

In the case of placenta prævia centralis Nijhoff[2] adopts the following method: As soon as the internal os admits one or two fingers the placenta should be carefully perforated, so as not to tear through the amnion at the same time. The amnion should then be separated as far as possible from the fetal surface of the placenta, and gentle friction made upon the fundus, so as to push the bag of amnion through the rent. The vagina should then be tamponed tightly with iodoform-gauze, and labor allowed to proceed. If the amnion be unexpectedly torn through, podalic version, followed by drawing down the hip into the lower uterine segment, should be performed. [We cannot recommend this procedure. It would be much more expeditious, and safer for both mother

[1] Arch. de Tocol. et de Gynéc., Nov., 1895. [2] Loc. cit.

and child, to immediately perforate the placenta in its entirety and deliver the child rapidly by podalic version. A distinct contraindication to the method exists, as Nijhoff himself admits, when the placenta is difficult to tear through.]

ABORTION.

[Much has been written upon the great danger of premature loss of the ovum to which all childbearing women are exposed, but, aside from the very decided stand that has been made by the better portion of the profession against the practice of criminal abortion, not only by so-called "specialists," but by women themselves, very little new has been added.] Foerster[1] emphasizes the importance of abortion as an etiologic factor in gynecology, and urges a more careful attention on the part of the general physician to the management of those cases that fall into his hands. The danger of quinin in pregnancy is again discussed by Coromilas,[2] who states that although in some cases quinin administered to pregnant women appears to have little oxytocic action, in others it has the power of exciting uterine contractions, more particularly in delicate, nervous, and anemic women. He has also observed that quinin administered during menstruation in some cases stops the flow, and frequently diminishes it. He relates the histories of 4 cases in which quinin apparently induced labor-pains, and concludes that during pregnancy and menstruation quinin should not be given in large doses, unless it be in conjunction with some narcotic that will act as a sedative upon the uterus. Titone,[3] in view of this action of quinin, would substitute for that drug phenocoll in pregnant women suffering from malaria. He has found that phenocoll has no action on the uterus. He gives it in doses of 1½ grams, divided in 4 cachets, to be taken according to the Roman method—that is, 5, 4, 3, and 2 hours before a febrile paroxysm is due. He has used the drug in many cases with beneficial results, and has never seen disastrous consequences follow.

Rare cases of abortion are recorded by Haultain,[4] O'Reilly,[5] and Barcus.[6] Haultain describes a rare form of abortion in which there occurred the expulsion of the amniotic sac alone, the third instance of the kind that has come under his notice. The patients were in each instance about 3 or 3½ months pregnant. No mention of such an anomaly is to be found in any of the standard text-books, except the American System of Gynecology and Winckel's Text-Book of Midwifery. The exact cause of this form of abortion is unknown, although Winckel is inclined to believe it to be the result of a simple accident, a tearing of the amnion from the chorion during expulsion. More probable is it that preexisting disease and death of the embryo has been present, rendering its attachment to the uterus less secure. This supposition is strongly supported by the specimen exhibited by Haultain. In the first case this is undoubted, there being no trace of embryo present. In the second case there was an excess of liquor amnii containing a large quantity of débris, and

[1] Ann. Gyn. and Pæd., Sept., 1895.
[2] Edinb. Med. Jour., Aug., 1895.
[3] Rif. med., Nov. 24, 1894.
[4] Edinb. Med. Jour., Feb., 1896.
[5] Lancet, Oct. 12, 1895.
[6] Med. News, Aug. 10, 1895.

an extremely feeble cord for the size of the embryo, while its placental end was represented by a thickened, smooth nodule, no trace of tearing being present. In the third specimen the embryo was free in the amniotic sac, unattached to the amnion. [Two facts are illustrated by these cases—namely, the possibility of the total absorption of the embryo, and, secondly, the continued secretion of the liquor amnii after the death of the embryo, although the hydramnios may have been the cause of the fetal death.] O'Reilly reports a case of hematocele supervening on an abortion. The effusion of blood took place into the subperitoneal tissue around the uterus. Three months later suppuration occurred, and the abscess discharged itself externally near the umbilicus, after which the patient made an uninterrupted recovery. [At least 2½ months of suffering could have been avoided by an early abdominal section and evacuation of the exuded blood.] Barcus records the sudden death of a woman from shock due to a self-intrauterine injection of a solution of lead acetate to induce abortion. There were no wounds made by the catheter rendering it possible for air or fluid to have been injected into the uterine sinuses; hence the death must have been due to shock. Mann[1] reports 3 cases of perforation of the uterus after abortion, with prolapse of intestine through the rents. He urges care in the use of dilators after abortion, at which time the uterus is much more easily torn than in the nonpregnant condition. L. J. Mitchell[2] records a case of sudden death from air-embolism following an attempt at abortion. At the autopsy, performed 6 hours after death, the right ventricle was found to be filled with air and blood churned together. The pregnancy was 10 weeks advanced, and the membranes had been punctured and separated from the uterine cavity over an area of 5 cm. No bacteriologic examination was made; hence, the gas-producing bacilli are not excluded, but Mitchell concludes that the peculiar circumstances attending the death and the short interval between the decease and the necropsy would seem to preclude the participation of these germs.

In the study of the *diagnosis of abortion* probably the most important paper of the year is that of Ayers,[3] who states that the weak spot in the relations of our profession to the management of abortion is our want of accurate knowledge of the anatomy and physiology of the uterus, decidua, and fetal membranes, and particularly of the chronology of the membranes in the first 3 months of pregnancy. The advantage of an accurate knowledge of the growth of the ovum as a whole lies in the fact that when we can name the week of pregnancy, having secured the embryo in a partial abortion, we can decide far more scientifically what treatment the uterus requires than by simply resorting to the curet. It is necessary, for properly managing these cases, to know how the tissues are arranged at 4 weeks, 6 weeks, 8 weeks, 10 weeks, and 3 months.

At Four Weeks.—The decidua is much the most important membrane at 4 weeks' gestation. The reflexa is fully formed, but does not occupy more

[1] Am. Jour. Obst., May, 1895.

[2] Medicine, Feb., 1896.

[3] Med. Rec., Sept. 28, 1895.

than three-fifths of the uterine cavity. Consequently on introducing the finger within the internal os it would, after having passed the vera at that point, come in contact with a body like a polyp at a distance of a little over $\frac{1}{8}$ in. The ovum is about the size of a large hazelnut. The chorion is fully formed on all sides, with the exception of the normal bald spot, the size of a well-dilated pupil. The amnion, on opening the chorion, will be found to embrace the embryo, but not to have expanded to more than half the distance to the chorionic periphery. The embryo will be found lying free within the amnion and about the size of a small Lima bean. The little elevations that are to form the extremities appear upon the embryo. The latter is a little larger than a good-sized pea.

At Six Weeks.—The decidua is still prominent and important. The vera is unchanged, the serotina has grown and thickened, the reflexa is undergoing an atrophy that began in the fifth week. The latter is nearer to the internal os. The chorion has expanded to the size of a silver half-dollar and enjoys a luxuriant growth of villi. The amnion is nearer the periphery, but is still separated from it. The embryo has doubled in size, and its extremities show an appreciable length.

At Eight Weeks.—The chorion and remnant of the decidua reflexa fully occupy the cavity of the uterus. The amnion also occupies the entire cavity of the chorion. The fetus measures 3.5 cm., and has the hands and feet well outlined. The decidua, having grown thinner, is less apt to come away complete, particularly as the chorion is more apt to rupture, and by the collapse resulting make it doubly difficult for the uterus to separate and expel the membranes. If the chorion escapes from the uterus without rupture, it generally escapes alone, leaving the decidua behind. This decidua should be removed at once, and the best medium for its removal is the finger.

At Ten Weeks.—The fetus and partially formed placenta are now the prominent parts in the uterus. The temporary villi of the chorion have largely disappeared, also the reflexa, leaving a thin layer, composed of the amnion and chorion, to be felt should the finger be introduced within the cervix. The prominent characteristics of abortion at this time are expulsion of the fetus and umbilical cord alone; their expression with the amnion, which may or may not be unruptured, the cord having separated from the forming placenta at its junction with the latter. The placental tissue is apt to remain in the uterus for a varying time and cause hemorrhage, and to become foul-smelling. It should be removed soon after the expulsion of the fetus.

At Three Months.—The placental form is now well established, and the uterine contents behave much as they do at full term, with these differences, that the placenta is less firmly put together and is more firmly united to the uterus. There is danger, therefore, of masses of placenta being retained, even though much may be expelled.

As regards the **treatment** of abortion, Strouse[1] would limit the use of the sharp curet to cases of septic endometritis, and believes that douching is never

[1] Univ. Med. Mag., Oct., 1895.

of service. Jacub[1] advises that threatened abortion be treated by absolute rest, with opium or viburnum prunifolium. When hemorrhage occurs without dilatation of the os and cervix the antiseptic tampon is indicated. When hemorrhage is present and a finger can be inserted, the uterus should be emptied by the finger, accompanied by antiseptic irrigation. If hemorrhage is considerable and only partial dilatation is present, the finger is the safest instrument to complete dilatation. In many cases, if the patient be kept clean, the membranes and placenta will be expelled without interference and without injury. In all cases ergot should be used in daily doses during the first week. The use of the sharp curet is not encouraged, and vaginal douches after abortion should be given for positive indications only. Jacub calls attention to the fact that to the finger the placenta feels exactly like the endometrium, and that it is quite possible for the physician to imagine that the uterus is empty when the placenta is completely adherent. Michailowa[2] concludes from a trial in 5 cases that, contrary to the accepted opinion, viburnum prunifolium not only does not always prevent abortion, but sometimes even occasions it, or, at least, accelerates a miscarriage already commenced. [From a large experience in the use of this drug in abortion we are not ready to accept this statement. It has been most efficacious when employed in conjunction with an opiate.] Warman[3] recommends asafetida in obstetric work, and claims that it is most efficacious in reducing the hemorrhage of threatened abortion. Especially has it been successful in cases of habitual abortion (*abortio habitualis*), 5 instances in all having been observed by the author. The drug is administered in pills containing 1½ gr. or in the form of an enema containing the tincture. In the habitual cases the dose at first is 2 pills a day, increasing to 10, the number subsequently being again reduced. No unpleasant symptoms are produced, but, on the other hand, the action of the bowels is very much assisted.

Hartmann and Toupet[4] have exhaustively studied the changes that nonseptic fragments of placenta may undergo when left attached to the uterine wall. These changes are—1. Simple sclerosis of the placental tissue; 2. Benign deciduoma; 3. Hydatiform mole; and 4. Malignant deciduoma. In all chorionic villi are to be detected by the aid of the microscope. By benign or innocent deciduoma is understood the true placental polypus and more sessile growths, in which there is distinct evolution going on in the chorionic villi and no sclerosis of the connective tissue. The growth does not, however, recur after thorough removal. The authors relate a case in which, as usual, the prominent symptom was frequent metrorrhagia. Legars and Lévi describe a very distinct case of placental polypus with the same symptoms. The malignant deciduoma which Hartmann and Toupet term "chorion-cell sarcoma," and the hydatiform moles are, in their opinion, related. In the latter, so long and so well known to the obstetrician, just as in the former, which appears to be a disease but recently recognized, the growth tends to invade and even perforate the uterine wall. In these graver as in the less serious changes in

[1] Monatsh. f. Geburtsh. u. Gynäk., Sept., 1895, Bd. ii. H. 3. [2] Med. Oboz., 1895.
[3] Therap. Monatsh., Jan., 1895. [4] Ann. de Gynéc. et d'Obstét., Apr., 1895.

retained placental tissue uterine hemorrhages are always an early and prominent symptom.

The Induction of Abortion.—Jeffé,[1] from a study of the literature of the last 10 years, fixes the indications for inducing abortion as follows: *Absolute Indications.*—1. Uncontrollable vomiting of pregnancy; 2. Incarceration of the gravid uterus; 3. Obstruction of the pelvic outlet by tumors or exudates; 4. Progressive and pernicious anemia; 5. Grave chorea. *Relative Indications.*—1. Great contraction of the pelvis, with the conjugata vera below 5 cm.; 2. Pulmonary emphysema, with signs of degeneration of the heart; 3. Nephritis; 4. Chronic heart-disease; 5. Other general diseases of the mother that would jeopardize her life at the time of delivery. He holds that a conjugata vera of 6 cm. and advanced pulmonary tuberculosis should not be regarded as indications for abortion; he does not think it just to sacrifice a future life for one that is "certainly lost." Garrigues[2] believes that the conditions that justify artificial abortion, apart from acute diseases, are, especially, serious pulmonary tuberculosis, severe valvular heart-disease, aortic aneurysm, carcinoma not amenable to radical treatment, chronic nephritis, severe affections of the nerve-centers, and present or threatened insanity. Ahlfeld[3] discusses the value of Müller's method for determining the indications for induction of labor by pressing the head of the child into the pelvic brim. While this method has advantages, it is not to be relied upon solely. Ahlfeld prefers to estimate carefully the period of gestation, to measure the length of the fetal body within the womb, to compute the length and weight of the fetus, and to combine these data with those given by palpation. It is also to be remembered that a fetal head which cannot be pressed downward into the pelvis can be brought through after version, the breech preceding.

As regards the method of the induction of abortion, Garrigues[4] dilates the cervix by conical hard-rubber and expanding steel dilators until there is room enough at least for a curet, but, if possible, for a finger besides; he then curets as long as anything comes away. Before scraping, the uterus is washed out with creolin, and afterward a quart of a 1 % solution of that drug is passed through the uterus by irrigation. Drainage is not needed during the first 2 months; later the uterus should be packed with iodoform-gauze, which must be gradually withdrawn, so as to give the organ a chance of contracting well before the last of the packing is removed, from 4 to 6 days after the operation. Puech[5] believes that curettage of the gravid uterus should be placed among the classical methods for producing artificial abortion.

[It is now 3 years since Pelzer of Cologne first advocated glycerol-injections for inducing labor, and already sufficient data have accumulated to prove the extreme danger of such a procedure. Even Pelzer himself has abandoned it, because of the danger of maternal nephritis, and, in addition, he states that large doses of glycerol are apt to destroy the life of the child by exciting too

[1] Med. Neuig., No. 45, 1894.
[2] Am. Gyn. and Obst. Jour., June, 1895.
[3] Monatsh. f. Geburtsh. u. Gynäk., Bd. i. H. 6, 1895.
[4] Loc. cit.
[5] Ann. de Gynéc. et d'Obstét., Aug., 1895.

violent uterine contractions.] Hypes[1] in examining 33 reported cases treated by this method finds that 13 children were lost. Ferrari[2] concludes that glycerol injected into the uterus does not possess a constant and reliable action, nor does it produce a certain result; that it is dangerous, owing to the changes that it produces in the blood and kidneys; that it should not be used when the kidneys are diseased; and that death of the fetus may result from its employment.

Kufferath[3] describes a method [which cannot be pronounced as altogether new] for inducing premature labor in the later months of pregnancy. The neck of the uterus is fixed with a volsellum, and a glass cannula attached to an irrigating apparatus is passed through the internal os and made to press lightly against the membranes. The lower uterine segment is then irrigated at low pressure, and the membranes thus separated in the neighborhood of the internal os without the position of the child being altered, and without causing pain if care be taken that the fluid escapes easily. The fluid used by Kufferath was sterilized water containing a little boric acid in solution, and the quantity employed varied from 1 to 2 liters. He had successfully adopted this procedure in 15 cases, and claims that it is much more powerful and rapid than any other.

EXTRAUTERINE PREGNANCY.

[**Ectopic pregnancy** has claimed the attention of many obstetricians during the past 12 months, an unusually large number of interesting cases having been reported. This is probably the result of the increased knowledge of the subject the result of the extensive investigations that have been carried on during the last decade, so that cases formerly overlooked or treated as pelvic hematocele are now properly diagnosticated and treated.] The most scientific paper of the year is that of Pilliet,[4] who describes the researches which he has made in studying the changes that the uterus undergoes during **tubal gestation.** He finds that a true deciduous membrane forms within the womb in these cases. It is usually expelled at from 6 weeks to 3 months of pregnancy. Two conditions in these cases attract attention: the first is the characteristics of the deciduous membrane as found in the uterus, and the second the condition of the uterus after the expulsion of the decidua. So far as the first is concerned, the decidua found within the womb in cases of ectopic gestation is remarkably swollen and engorged. It resembles the normal mucosa but little. Upon the superficial aspect of the membrane there are abundant blood-vessels in a condition of engorgement, while the tissues surrounding them are somewhat edematous. In some places exudations of blood and serum may be observed. Some of these hemorrhages are the result undoubtedly of exertion and fatigue, and resemble the premature detachment of the placenta. In other places the extravasated blood is found to contain what resemble placental villi. [No true placental tissue can be formed in the uterine cavity in tubal gestation.] This decidua may be expelled in considerable quantities, or it may be

[1] Am. Jour. Obst., No. 61, Dec., 1895.
[2] Therap. Gaz., July 15, 1895.
[3] Congrès de Gynéc. de Bordeaux, Aug., 1895.
[4] Ann. de Gynéc., Oct., 1895.

gradually extruded with its cellular elements in an abundant serosanguinolent fluid. In the latter case its recognition is more difficult. This tissue resembles very closely the network of capillaries found in granulations and in sarcomatous tissue. The muscular tissue that underlies the basement membrane is also hypertrophied, undergoes involution slowly, but shows no signs of genuine inflammation. After the expulsion of the decidua the uterus presents many signs of parenchymatous metritis in the vascular lesions present in the dissection of muscular fiber by layers of embryonal cells. This condition may be traced to the peritoneum. When curetting is practised in these cases but little is removed, because the decidua has all escaped. New tissue gradually develops where the decidua has been removed, and the epithelium is slowly re-formed. The condition of metritis may persist for a long time; without the clinical history of the case microscopic examination would render it difficult to make a diagnosis. [From these studies it is easy to observe how readily the one condition present may be overlooked if the physician confine his attention to the condition of the uterus. Without a thorough examination of the pelvis, and without studying the clinical history of the case, the true diagnosis may readily be missed.]

Of equal interest with the foregoing is James Oliver's contribution on the extravasation of blood in tubal pregnancy.[1] He states that during the evolution of a natural pregnancy there results not only an augmentation in the size of the blood-vessels of the uterus, but a hypertrophy of the tissues of this organ generally. When, however, the fecundated ovum develops in the Fallopian tube, it seldom happens that any vigorous local growth is excited by its presence, although the blood-vessels in the involved tube become greatly enlarged. Apart from any intrinsic disease, the integrity of a blood-vessel depends greatly upon the manner in which it is supported by the surrounding tissues. When, therefore, the pressure exerted by the Fallopian tube against a growing ovum is insufficient to support the correlatively enlarged blood-vessels, they rapidly become thinned, and rupture with extravasation of blood takes place on the slightest provocation. When the developing ovum is located in the cavity of the uterus, we are accustomed to believe that accidental hemorrhage from the maternal vessels never takes place until after the fourth week of pregnancy. Whether this belief be correct or not, it is evident that in tubal pregnancy accidental hemorrhage from the vessels in the mucous lining of the Fallopian tube may occur as early as the seventh or the tenth day after impregnation. In ectopic pregnancy, therefore, blood may be extravasated from the maternal vessels before the chorionic villi become vascular—a phenomenon that happens during the third week of pregnancy when the chorion becomes incorporated with the allantois. The paroxysmal attacks of severe pain that are sometimes experienced in cases of tubal pregnancy are due to these effusions of blood, and, although the primary hemorrhage occurs always whilst the ovum is living, subsequent hemorrhage may nevertheless happen after this body has died. Rupture of the Fallopian tube itself, which has gradually become more

[1] Lancet, Dec. 7, 1895.

and more thinned, may be induced by the first or any succeeding extravasation of blood; and as this accident may occur as early as the fourth week of pregnancy, before the chorionic villi have begun to participate in the formation of a true placenta—for the ovum is everywhere placental at this period—the breech in the continuity of the tube is not, in all cases at least, attributable to a thinning at the placental site or to a penetration of the tube by the villous processes. A portion of the external hemorrhagic discharge—vaginal—which is observed in the early days of some tubal pregnancies comes directly from the ruptured vessels in the tube. [This paper is of considerable interest, as throwing some additional light on the etiology of the rupture in a tubal pregnancy.]

The relation existing between hematocele and extrauterine pregnancy is considered by Küstner,[1] who believes that the greater portion of these extravasations are due to ectopic gestation. Wyder has proposed making sure of the diagnosis by curetting the uterus and examining the material obtained for decidual membrane; but this method is not without danger, and negative evidence proves nothing. In cases of doubt it is, however, justifiable to aspirate the tumor through the vagina. When left to itself, the blood-clot coagulates about the periphery and remains fluid in the central portions, so that it can sometimes be shelled out of its capsule as if it were a cystic tumor. The tube is sometimes surrounded by the clot, sometimes free from it. The chorion can usually be found, but rarely the fetus.

According to Hofmeier,[2] the **diagnosis of etopic gestation** during the first 2 months is always difficult. Frequently there may be noticed a very marked pulsation in the affected side; the disappearance of this, the non-increase in size, as well as a gradual hardening of the tumor, point to a commencing disintegration, while an increase in the pulsation denotes a growth of the pregnancy. The removal of a piece of the uterine mucosa for investigation, which, in the early stages, gives the best means of diagnosis, is exceedingly dangerous; and in further advanced and doubtful cases this procedure is of no value. The pains, which are usually referred to tubal contractions and grouped under that name, are clear evidence, after the decidua has been thrown off, of the end of pregnancy.

Cripps[3] enlarges upon the chief points in the differential diagnosis between rupture occurring free into the peritoneal cavity, and when it occurs between the layers of the broad ligament, and when circumscribed in Douglas's pouch. When the sac bursts into the peritoneum, pain, though severe, is not so intense as when the bleeding is into the broad ligament. On the other hand, the general symptoms are graver, doubtless due to a larger amount of blood being lost. The abdomen is tender; it is resonant in front, and often there is considerable impairment of resonance, or even dulness, in the flanks. Careful palpation of the abdomen fails to detect any obvious tumor. On making a vaginal examination the uterus is movable and in the natural position. No tumor can be felt, but there may be some fulness in Douglas's pouch, convey-

[1] Aerztl. Rundsch., 1894, p. 817. [2] Centralbl. f. Gynäk., No. 31, 1895.
[3] Brit. Med. Jour., Mar. 28, 1896.

ing a doughy feeling to the finger, doubtless due to blood-clot. Examination of the rectum shows no stricture of the bowel.

If the rupture has occurred between the layers of the broad ligament, the sudden onset of the symptoms will be the same, but the pain seems to be more intense and lasting, with a well-marked paroxysmal character described by patients as like labor-pains. The patient generally shows signs of hemorrhage, though to a much less degree than in the intraperitoneal cases. On deep abdominal palpation a hard-feeling tumor may be found in one or the other side, rising out of the pelvis, though not to a great extent. Sometimes the swelling does not rise sufficiently to be obvious on abdominal examination. It is on examining by the vagina, however, that the more important points in the differential diagnosis are to be obtained, for in intraperitoneal rupture there is nothing abnormal to be felt, save perhaps the puffy swelling already alluded to in Douglas's pouch, whereas in the broad-ligament variety a hard swelling can be felt on one or other side of the cervix, partly filling the pelvic cavity. The tumor is firmly fixed, while the uterus, pushed to one side, appears to form the inner boundary of the swelling, and is attached to it. On examining the rectum a marked constriction is often present at about 4 in. from the anus; this is due to the rectal fascia, which passes round the bowel and is continuous with some of the broad-ligament fibers. Hence, if the broad ligament is pulled upon, as it is when distended by an effusion between its layers, the rectal fascia becomes drawn tighter, producing a ring-like stricture. When rupture occurs into Douglas's pouch, owing to the slight oozing which at first takes place, and which is the probable cause of the localized peritonitis that ultimately limits the effusion, there may be an absence of the sudden acute pain, followed by collapse which is so characteristic of the other two varieties of rupture already mentioned. The general history suggestive of a pregnancy may be present, together with some pain, though not of an acute nature, about the pelvis. An examination through the vagina discloses a swelling, perhaps the size of a cocoanut, and this lies behind the uterus in Douglas's pouch. The swelling is elastic, feeling like an ovarian cyst. The uterus, although its mobility is impaired, is not so firmly fixed as in the broad-ligament cases, and there is no stricture of the rectum.

Interesting cases of **tubal pregnancy** are reported as follows: Hofmeier,[1] 14 cases, 9 of which were operated upon, with 1 death; of the 5 cases not operated upon, 1 died of hemorrhage and 1 of septicemia, 2 were cured by spontaneous atrophy of the tumor, and 1 by the formation of a lithopedion; Hundley,[2] 2 cases; Bovée,[3] 1 case, in which all of the characteristic symptoms of the condition were absent; also [4] a case in which rupture followed the use of ergot; also [5] 1 additional case; Klein,[6] 1 case; Wawra,[7] 1 case; McColl,[8] 4 cases, 2 recovering without operation; Alfred J. Smith,[9] a case of ruptured tubal preg-

[1] Loc. cit.
[2] Am. Jour. Obst., Feb., 1896.
[3] Ibid., Sept., 1895.
[4] Va. Med. Monthly, Dec., 1895.
[5] Jour. Am. Med. Assoc., Apr. 4, 1896.
[6] Wien. med. Woch., Sept. 21, 1895.
[7] Ibid., Nov. 9, 1895.
[8] Physician and Surgeon, July, 1895.
[9] Dublin Jour. Med. Sci., Apr., 1896.

nancy, with hematosalpinx of the opposite side, in a woman 33 years of age with 4 children, the youngest 2½ years of age; the hematosalpinx was not the result of tubal gestation; Cripps,[1] 10 cases, 1 of which, an abdominal pregnancy at 6 months, resulted fatally; F. W. Johnson,[2] 3 cases, in 1 of which there had occurred an external migration of the ovum, and in which hysterectomy was required; Doran,[3] 4 cases of early extrauterine gestation; Ingraham,[4] 2 cases; Henry,[5] 1 case; Foerster,[6] 7 cases, 4 of them being instances of tubal abortion; Malherbe,[7] a case which ruptured into the peritoneal cavity and projected through the inguinal canal in the sac of an old hernia, giving rise to all of the symptoms of a strangulated hernia; Elischer,[8] 2 cases cured by elytrotomy, both recovering, although 1 suffered for 3 days from iodoform-poisoning; Donald,[9] 1 case cured by vaginal celiotomy; Marx,[10] 1 case cured by the vaginal operation; Dührssen,[11] 2 cases treated by vaginal celiotomy; Condamin,[12] 5 cases treated by extirpation through the vagina; Schwarz,[13] the remarkable case of a patient who, when 2 months pregnant in tubal gestation, was taken with severe collapse; a tumor formed at the left of the uterus, and the patient gradually rallied from her collapsed condition. Two weeks later the hematocele ruptured into the bladder, and the woman began to void clots of blood and shreds of membrane. In 4 weeks the tumor at the side of the uterus could not be felt, while in 7 weeks the patient was convalescent and the uterus had undergone involution; Lanphear,[14] 3 cases, in 1 of which abdominal section was performed on the 15th day after rupture, and in another, which was complicated by an edematous myoma, hysterectomy was required, the patient perishing, however, 1 hour after the operation; Hall,[15] 6 cases, 2 of which perished shortly after operation; Moore,[16] 1 case with extraperitoneal rupture of the sac, the patient dying 13 hours after the operation. [According to Bland Sutton, only one-fourth of the cases of tubal gestation rupture extraperitoneally, and of those that do rupture in this manner almost all develop toward the anterior portion of the abdomen instead of along the posterior portion, as in Moore's case—hence the special interest attached to this case]; Barrow,[17] 4 cases; Breese,[18] a case in which 2 years after treatment by Apostoli's method, during which time the patient was an intense sufferer, the decomposing fetus was discharged per rectum, and 1 year later the sac was removed by abdominal section. [This is a good illustration of the danger attendant upon this most irrational and unsurgical method of treatment]; Nichols,[19] 1 case diagnosed before rupture and successfully operated upon; Baldwin,[20] 4 cases, 1

[1] Brit. Med. Jour., Mar. 28, 1896.
[2] Boston M. and S. Jour., Nov. 7, 1895.
[3] Lancet, Mar. 28, 1896.
[4] Buffalo Med. Jour., Aug., 1895.
[5] Am. Gyn. and Obst. Jour., Jan., 1896.
[6] Med. Rec., Mar. 30, 1895.
[7] Ann. Gyn. and Paed., May, 1895.
[8] Centralbl. f. Gynäk., No. 31, 1895.
[9] Brit. Med. Jour., Jan. 11, 1896.
[10] Am. Med.-Surg. Bull., Feb. 22, 1896.
[11] Centralbl. f. Gynäk., No. 15, 1895.
[12] Ann. de Gynéc., 1895, vol. xliv.
[13] Centralbl. f. Gynäk., No. 37, 1895.
[14] Med. Rec., Sept. 14, 1895.
[15] Ann. Gyn. and Paed., Sept., 1895.
[16] Intercol. Med. Jour. of Austral., Feb. 20, 1895.
[17] Am. Pract. and News, Aug. 24, 1895.
[18] Am. Gyn. and Obst. Jour., Mar., 1895.
[19] Canad. Pract., Dec., 1895.
[20] Brooklyn Med. Jour., Nov., 1895.

of which died 7 days after operation, which was performed 1 month after rupture of the gestation-sac, and in 1 of the others operation being performed 6 weeks after rupture; Rosenwasser,[1] a case in which an abdominal hematocele formed on the right side, the abscess-cavity extending from the iliac fossa upward and backward under the liver and well toward the spinal column, and resulting in a pleuropneumonia of the right side, beginning at the base and ascending to the apex; the patient ultimately recovered; George H. Noble,[2] a case in which operation was performed on the tenth day after the primary rupture, and hysterectomy was required on account of an unusual softening of the right broad ligament, resulting in a separation of that structure from the uterus throughout its entire height to a point below the internal os; the patient made a good recovery; Lauder,[3] 1 case; Grandin,[4] 3 cases; Jenks,[5] 1 case, in which was removed by abdominal section a distended, adherent, and painful tube containing an encysted 3 months' fetus; recovery was normal, though the patient was unmanageable and was out of bed every day after the day of operation; Jonas,[6] 3 cases treated by abdominal section after rupture, with recovery; Moffatt,[7] 1 case, diagnosed after rupture, successfully treated by abdominal section; and Boyd,[8] 2 cases.

More than the ordinary amount of interest is attached to the following reports: Folet,[9] a case of tubal pregnancy with twins, with retention for 15 years of a dead fetus at term. One fetus died at the second or third month of pregnancy; the other lived to term [which is an exceedingly rare occurrence in tubal pregnancy], the fetal sac with its contents remaining for 15 years in the abdomen of the patient without causing any illness. Then slight attacks of peritonitis, beginning with sharp pain, became frequent, and the patient entered the hospital for an operation. The fetal sac was adherent to the intestine, and a portion of the fundus could not be removed; it was accordingly sutured to the lower border of the wound. Complete recovery took place in 6 weeks after the removal of the tumor. The fetus was not a lithopedion; its tissues were flexible, but dense, and of a leathery consistence; they retained their normal structure; Le Dentu[10] records a case of twin tubal pregnancy, the two embryos, of 7 to 8 weeks' growth, existing in a single sac. Thus far, double bilateral twin pregnancies (7 cases in the thesis of Cestan and 4 in Brodier's observation) and twin tubal pregnancies in a double sac (3 cases, according to Cestan's thesis) have been recorded, but never before a case in which the embryos existed in a single sac; Bloom,[11] an abdominal section for double extrauterine pregnancy 13 weeks after abortion; both tubes were pregnant, and both had ruptured; the patient recovered; Ross,[12] a case of very early ectopic gestation with complete separation of the left tube from the uterine cornu at the time of rupture; abdominal section was performed under

[1] Am. Gyn. and Obst. Jour., Nov., 1895.
[2] Ibid., Oct., 1895.
[3] Yale Med. Jour., Feb., 1896.
[4] Am. Med.-Surg. Bull., Nov. 15, 1895.
[5] Med. Age, Dec. 10, 1895.
[6] Omaha Clinic, Dec., 1895.
[7] N. Y. Polyclinic, Feb. 15, 1896.
[8] Am. Gyn. and Obst. Jour., July, 1895.
[9] Mal. des Femmes, Apr. 25, 1895.
[10] Bull. de l'Acad. de Méd. Paris, Mar. 3, 1896.
[11] Phila. Polyclinic, July 28, 1894.
[12] Am. Jour. Obst., Oct., 1895.

ethyl-chlorid anesthesia. The portion of the tube containing the ectopic gestation was no thicker than an ordinary lead-pencil, and the pregnancy it contained could not have been of longer duration than about 2 weeks; the seat of the trouble was close to the uterine cornu in the isthmus of the tube, in the narrowest and least elastic portion; hence the early rupture. The patient died within a few hours. [This is possibly the earliest case of ruptured ectopic pregnancy recorded, 30 days being the earliest hitherto noted]; Walther,[1] a case of ectopic and entopic pregnancy with double uterus, the patient being 35 years of age; the tubal pregnancy was situated on the left side and was associated with a pregnancy in the right half of an ill-developed uterus of 3 months; in the left tube there was a hematoma; the patient aborted on the third day after operation; in the right half of the uterus were found the placenta, cord, and membranes, while upon the left side a thick deciduous membrane was present; the patient made a good recovery; T. E. Mitchell,[2] a case of simultaneous uterine and extrauterine gestation in a woman of 30 years, with 1 child 1 year old. Operation was not performed, and the patient died 3 days after a 5 to 6 months' fetus was extracted from the uterus by version. Necropsy revealed an adventitious sac behind the left broad ligament, to the posterior surface of which the placenta was attached. The fetation had been primarily tubal, rupture occurring 4 months prior to death. The fetus was slightly smaller than its uterine fellow; Moseley,[3] an interesting case of twin pregnancy, 1 fetus being intrauterine and the other extrauterine (tubal); the woman was delivered of her first—a 7 months' child—in March, 1895. Her menstrual flow returned in May, and recurred normally for the next 3 months. The September period was missed, and about the middle of November she began having irregular bloody vaginal discharges, together with local pain, followed on November 27th with a fainting-spell. Irregular bleedings continued until December 6th, when examination revealed the uterus enlarged to the size of 3½ months of pregnancy, and the right tube a sausage-like mass about the size of an ordinary round 2-ounce bottle, and having a moderate amount of elasticity. Operation the next day revealed the abdominal cavity filled with fluid and clotted blood; the right tube was ruptured in its outer third, and attached to its inner surface was an umbilical cord, at the other end of which was a fetus floating in the abdomen. This was removed. The patient died 48 hours after admission to the hospital. On opening the uterus, which was soft, friable, and baggy, another fetus, *a duplicate of the first*, was found attached near the opening of the left tube. In the left ovary was found a recently ruptured Graafian follicle. The right ovary was not found, but it seems probable that the extrauterine fetus was the result of impregnation of an ovum from this ovary, while the intrauterine was from the left. [The diagnosis of twin intrauterine and extrauterine pregnancy must be most difficult, especially in its earlier stages. Gutzwiller says there are no diagnostic signs, and Schrenck states that there are 43 cases recorded, in only 3

[1] Zeit. f. Geburtsh. u. Gynäk., 1895, Bd. xxxiii. H. 5.

[2] Brit. Med. Jour., May 30, 1896.

[3] Am. Jour. Obst., May, 1896.

of which was a correct diagnosis made]; Ross,[1] a case of ectopic gestation occurring twice in the same patient at an interval of 4½ years; Ross publishes a table of 5 similar cases, all he has been able to find. [A similar paper was presented by McKelway in 1893 at the Milwaukee meeting of the Am. Med. Assoc., in which he tabulates a number of well-authenticated cases of repeated extrauterine gestation, including 1 occurring in his own practice and 1 in that of Dorland]; Dunning,[2] a case of ruptured interstitial pregnancy; and Gebhardt,[3] the same; Ahlfeld,[4] a case of sarcoma deciduocellulare with tubal gestation, in a single girl of 17 years, resulting fatally; and Hoepfl,[5] a case of cornual pregnancy cured by operation. Wendler[6] describes what he considers a unique case of extrauterine pregnancy occurring after vaginal hysterectomy. At the operation the right ovary was not removed and the tube was drawn down into the vagina. Menstrual molimina had appeared every month after the operation, and their cessation had led to an examination. A 6 to 8 weeks' old fetus was found occupying the vaginal end of the tube. The tube was dilated, and its contents, consisting of fetal membranes and chorionic villi, were removed by a curet.

Tubal abortion is discussed by Muret[7] and Prochownick.[8] The latter remarks that, anatomically, a tubal pregnancy differs from that of the uterus in that no true decidua is formed. The chorionic villi penetrate the mucous membrane of the tube and enter the muscular coat, forming a kind of serotina. The newly-formed vessels rupture easily, causing hemorrhage, which leads to the death of the fetus and the accidents usually following an ectopic pregnancy. The cases may be classified as abortions from the ampulla; abortions from the tube proper; rupture of the tube and the formation of a mole. Two or more of these conditions may be combined in the same specimen. Abortion from the ampulla occurs when the ovum has formed its attachment to the tube near the abdominal end. The act is partly passive, due to the hemorrhage forcing out the ovum, and partly active, due to muscular contractions. The fimbriæ, which are adherent about the end of the tube, give way; the ovum is gradually forced down, and finally is cast out into the abdominal cavity. If the end of the tube is adherent or any obstruction occurs which prevents the casting out of the ovum, the tube is liable to rupture. Ampullar abortion is not frequently met with in the operating-room, but undoubtedly many cases occur and recover without surgical interference. Abortion from the tube proper is not of frequent occurrence—8 cases out of 24 are reported. In all of these the placental site was near the uterus and on a part of the tube covered by peritoneum. In every case there was an hematocele about the abdominal end of the tube, containing blood and chorionic villi. The abortion is begun by a hemorrhage taking place into and about the ovum. Owing to the resistance

[1] Am. Jour. Obst., Feb., 1896.
[2] Am. Gyn. and Obst. Jour., Nov., 1895.
[3] Münch. med. Woch., Aug. 27, 1895.
[4] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. i. H. 3.
[5] Münch. med. Woch., Aug. 6, 1895.
[6] Monatsh. f. Geburtsh. u. Gynäk., 1895.
[7] Rev. des Sci. méd., Apr., 1895.
[8] Arch. f. Gynäk, xlix. No. 2, 1895.

of the uterus, the constantly increasing hemorrhage pushes the ovum toward the abdominal end; and this action is augmented by contraction of the tube. The farther the ovum is situated from the ampulla, the greater the mechanical difficulty of tubal abortion.

Muret states that if the abortion be incomplete, part of the ovum is retained in the tube and a tubal mole is formed. The symptoms of incomplete tubal abortion are tubal colic, the expulsion from the uterus of decidua without chorionic villi, and repeated attacks of intermittent pain with symptoms of internal hemorrhage. Abdominal section is always indicated for this condition.

Abdominal Pregnancy.—Cases of secondary abdominal pregnancy are recorded as follows: Mann,[1] 2 cases, 1 of which was in reality a pregnancy in one horn of a double uterus; the patient advanced to term, missed the labor, and the fetus was not removed until 8 years afterward, at which time a foul-smelling fetus was removed from a large sac that was closely adherent to the intestines; the patient recovered; in the second case the fetus had been retained in the abdominal cavity for 13 years, and when removed was somewhat shrunken and mummified, but not decomposed; the patient's recovery was uninterrupted; Tóth,[2] a case of rupture of the sac in the third month; the fetus continued to grow in the abdominal cavity until its death in the 36th week of pregnancy; an operation was performed 10 weeks later, and the primary condition found to have been a tuboovarian pregnancy; there was absence of fever; Pinard,[3] a case of extrauterine gestation at term cured by abdominal section; a living child was extracted, but the placenta was left *in situ*, the opening of the cyst being sutured to the abdominal wall and the cavity being packed with gauze; the patient recovered; Thomson,[4] 2 cases; in the first the ovum died at 6 months, and began to be discharged by ulceration into the vagina; incision and extraction of the ovum with its appendages were followed by cure; in a second case, in the last month of pregnancy, the ovum opened the abdominal wall by ulceration, causing in the process a fistula into the large intestine, which was subsequently closed by operation; Steltner,[5] a case in which the fetus lived nearly to full term, when it died; it was then carried by the woman for 12 years; at the end of 10 years the sac ruptured into the bladder and cystitis followed, and 2 years later a tumor of the right kidney—a hydronephrosis—resulting from temporary occlusion of the ureter following the contraction of the sac, which was adherent to the base of the bladder, was discovered; abdominal section was performed and the cyst evacuated and packed; the patient recovered; Reismann,[6] a case of tuboabdominal pregnancy with delivery of a living child at term; the gestation-sac consisted anteriorly of the uterus, posteriorly of peritoneal adhesions, while the broad ligament formed the right side. After extraction of the child there was profuse hemorrhage, arrested by removal of the placenta, which was attached to the peri-

[1] Buffalo Med. Jour., Aug., 1895.
[2] Centralbl. f. Gynäk., No. 31, 1895.
[3] La Sem. méd., xv. No. 39, 1895.
[4] Zeit. f. Geburtsh. u. Gynäk., Bd. xxxii. H. 1, 1895.
[5] Centralbl. f. Gynäk., No. 4, 1895.
[6] Ibid., No. 1, Jan. 4, 1896.

toneum of the culdesac and overlying the sacrum; the membranes were firmly adherent to the posterior uterine wall; after their partial detachment severe hemorrhage began, which could only be arrested by the removal of the uterus; after an attack of phlegmasia in the left leg the patient made a good recovery; the child was dolichocephalic, and showed an arcuate depression on the posterior portion of the frontal bone and the anterior portion of the parietal bone of the right side. The right ocular fissure was wider than the left, and the right angle of the mouth lower than the left. The right upper extremity was flexed at the elbow to a right angle, positive and rigid; the right hand was flexed inward and to the ulnar side; the four fingers were strongly flexed across the thumb. The right lower extremity was rotated inward and bent at the knee-joint to an obtuse angle; the right foot was in equinovarus, and the toes hyperextended. The head was flexed constantly to the right and drawn backward. The right sternocleido muscle was hardly to be felt, while the left was prominent and thick. Reismann concluded that this condition was due to cerebral spastic hemiplegia from compression of the skull in its cramped situation, the seat being in the central convolutions; Chase,[1] a case of tubal pregnancy, with primary extraperitoneal rupture into the broad ligament and secondary intraperitoneal rupture at the fifth month with fatal hemorrhage; Handfield-Jones,[2] a case of extrauterine fetation with operation near full term, the child living, but the mother perishing of sepsis 3 weeks after delivery; Eagleson,[3] a case of abdominal pregnancy at full term, with rupture of the sac and death of the fetus; the patient was 36 years of age and in her second pregnancy, the first occurring 17 years before. Pregnancy began in February, 1894, and on May 13 she suffered from severe uterine and abdominal pains, accompanied by profuse hemorrhage which continued for 4 or 5 days, and during which time a membranous cast of the uterus was expelled. Labor occurred in November, and was accompanied by uremic convulsions. Abdominal section was performed and a macerated fetus removed. The sac was readily removed, there being but few adhesions to the intestines, and these being easily separated; the placenta was firmly attached to the top and posterior surface of the uterus, and to the right broad ligament; the principal nutrient vessel of the placenta, as large as a small lead-pencil, came from the under surface of the mesentery of the ilium; commencing peritonitis was present, but the patient made a good recovery; Corus,[4] a case in which the fetus survived until the seventh month, and at the fourteenth month was spontaneously discharged per rectum, the patient dying from exhaustion on the ninth day after the escape of the fetus; Kaan,[5] a case in which a dead fetus was secured, the patient being a woman of 36 years, in her third pregnancy, the last pregnancy ending in a miscarriage 18 months previously. Rupture of the tubal pregnancy had probably occurred in June, 1895, but was unattended with collapse. Labor occurred in December, the

[1] Brooklyn Med. Jour., May, 1896.
[2] Lancet, Oct. 19, 1895.
[3] Jour. Am. Med. Assoc., No. 8, 1896.
[4] St. Louis Clinic, Apr., 1895.
[5] Boston M. and S. Jour., Apr. 30, 1896.

fetal heart-sounds being audible. Abdominal section was performed, the dead fetus extracted, the placenta clamped with large forceps, and the sac packed with gauze. The mother did not recover from the shock, and the autopsy showed the sac in the median line, evidently in the left broad ligament, entirely covered by peritoneum; the uterus was pushed downward, forward, and to the right. The sigmoid flexure ran across the top of the mass. The sac contained the placenta and about half a pint of postmortem clot. The uterus was enlarged and its walls thickened; W. R. Wilson,[1] a case of abdominal pregnancy that progressed to term in a colored woman 26 years of age. Abdominal section was performed and a dead fetus lying in a transverse direction extracted; hemorrhage could not be controlled, and the patient died in a little more than an hour after the operation. Necropsy revealed the amniotic sac adherent to the intestines, and the placenta distributed over the pelvic and abdominal viscera on the right side. The right tube and ovary were incorporated in this mass. Kollock[2] removed by abdominal section, from a woman who had gone 4 months beyond the normal term of pregnancy, an enormous fibroid tumor of the womb and a 10-pound macerated fetus which was surrounded by a large amount of offensive purulent fluid. The placenta lay in the right hypochondrium, was adherent to the sternum, and was removed with much difficulty and with excessive hemorrhage, which was finally controlled by packing the cavity with 6 yards of gauze and 3 of towelling. The patient did well for a month, and then died suddenly from intestinal obstruction. The autopsy showed a normal uterus and normal ovaries. The pregnancy had originally been left tubal, and had ruptured when about the size of an orange. The fetal sac had developed between the abdominal wall and the omentum. There were no intestinal adhesions, except one small band which had strangulated a loop of small intestine and caused the fatal termination.

Ovarian Pregnancy.—The following case, reported by Larsen,[3] is one of such rarity as to merit full mention: The patient was 33 years old and previously healthy. Her menses began at 20, and were regular except on one occasion, when 1 or 2 months were missed. A profuse flow was exceptional. She last menstruated in the beginning of August, 1891. Immediately after this she was seized with cramps, vomiting, and some pelvic pain. Three months later she had retention of urine, at which time, on examination, a uterine pregnancy at 3 months and enlargement of the right ovary were diagnosed. During the remainder of her pregnancy the patient's condition was good. Motion was felt by the middle of December, and on the 10th of the following April there were severe shooting pains accompanied by some hemorrhage and the passing of a firm lump the size of a hen's egg. Motion ceased at the same time. A thin, light, sanguineous discharge continued from the vagina, and at every return of the menstrual epoch this discharge acquired the appearance of the menstrual flow; otherwise the patient's general condition was good. On the 22d of September the diagnosis was made, under

[1] Am. Gynæc. and Obst. Jour., May, 1896.
[2] Medicine, Feb., 1896.
[3] Centralbl. f. Gynäk., No. 28, 1895.

anesthesia, of a dead fetus retained in the uterus. Upon dilatation of the cervical canal, however, the body of the uterus, which on palpation could not be differentiated from the tumor, was found to be empty. On September 27th abdominal section was performed, with extirpation of the tumor, which was attached by a single rectal adhesion, though otherwise freely movable in the abdominal cavity, and united to the uterus by the right tube and broad ligament, which were also tied off. The right ovary could not be seen and the left tube and ovary were normal. Convalescence was uneventful. Upon opening the fetal sac a quart of chocolate-colored, thin, and very flocculent fluid, with a macerated, flattened, and apparently fully-developed fetus, placenta, and cord, were found. The placenta was attached to the posterior wall of the sac, while the anterior wall was adherent to the broad ligament, though this was easily separable except at the upper and outer part. At this place it was immediately continuous with the fetal sac, and this in turn was firmly attached, for a distance of $4\frac{1}{2}$ cm., especially thick at the under part, to the posterior surface of the tube. The inner and upper part of the sac, near the uterine end of the tube, was also firmly united to the posterior surface of the ligament by a small adhesion. The portion of the tube that was removed measured 10 cm., and was much dilated. In the broad ligament could be seen three branches of the internal spermatic artery, the middle branch going to the fetal sac, which was also supplied with branches from the outer ones. The posterior surface of the sac was as thin as paper, while the anterior was fibrous in character and studded with the open mouths of the torn vessels; it was about 8 mm. in thickness.

The microscopic examination of the anterior wall showed here and there small groups of follicles with a distinct membrana granulosa, and in several of these appeared more or less well-preserved ovules with germinal vesicle and germinal spot.

Treatment of Extrauterine Pregnancy.—[Notwithstanding the general condemnation of any method of treatment of extrauterine gestation other than the surgical, we occasionally find some man of considerable standing advocating an obsolete method. These revivals, fortunately, are of but short duration.] Thus, in the Section for Obstetrics and Gynecology of the recent Congress of German Naturalists and Physicians, Prochownick[1] advocated the treatment of ectopic pregnancy during the first months by means of injections of morphin instead of by operation. He reported 4 cases successfully treated by a single injection through the vagina of from gr. $\frac{1}{2}$ to gr. $\frac{3}{4}$ of morphin into the intact gestation-sac without aspiration. In 3 of the cases the pregnancy had not passed the twelfth week; in the remaining 1, which was complicated by gonorrhea, this period had been passed, and in this case also an abscess formed that discharged through the rectum. In a fifth case the injection was made through the anterior abdominal wall, and the sac was infected by the needle passing through an adherent loop of bowel; septicemia developed, abdominal section was required, but recovery ensued. It is

[1] Deutsch. med. Woch., 1895, No. 40, Suppl. No. 25, p. 170.

important to refrain from aspiration and to make but a single injection. The operation is contraindicated if the twelfth week has passed, if abortion is in process of occurrence, and if chronic gonorrhea or acute perimetritis exist. The vaginal is the only safe route of injection. [We may safely say that there is no safe route for such an operation, and even if fetal death be assured the woman is subsequently subjected to all of the dangers of sepsis during the process of absorption—if this should fortunately occur—or, more probably, to the danger of a secondary abdominal section. The primary section is by far the preferable and safer mode of treatment.]

Dührssen, Condamin, and others have performed vaginal celiotomy in a number of instances for the relief of this condition, and earnestly advocate this method in cases in which the pregnancy is not advanced more than 3 months. They claim that the shock is less than from abdominal section, while the result is equally and, possibly, more satisfactory. A case of ectopic pregnancy successfully operated upon by the vaginal method is reported by Reynolds:[1] A fetus of the lithopedion type, about the size of a 3-months' gestation, was found; fetus, placenta, and cord were removed intact. [The operation, however, is more difficult than abdominal section, and the same objections are applicable to it as to the operation for any gynecologic condition.]

LABOR AND THE PUERPERIUM.

Statistics.—Among the interesting statistics from large institutions mention should be made of the reports of Jardine[2] and Norris.[3] Of 2161 cases of labor attended during 4 years at the West End Maternity Hospital, Jardine states that there were only 3 which could not be delivered at full term without sacrificing the child. The fatal cases were 10. There were 5 cases of placenta prævia, all successful except 1 that died before assistance could be reached. Of 9 accidental hemorrhages, 8 were successfully treated. There were 9 postpartum hemorrhages, all successfully treated, and 2 cases of eclampsia, both recovering. In puerperal sepsis the practice of douching with mercuric chlorid (1 : 2000) was followed. Norris's report included 500 consecutive deliveries at the Preston Retreat since Jan. 1, 1894. There was 1 death from chronic Bright's disease, which made the mortality for this period $\frac{1}{5}\%$. There were 3 cases of eclampsia, all recovering; 1 case of placenta prævia; and 1 of premature detachment of the placenta, the child perishing, but the mother recovering; 2 mild cases of phlegmasia alba dolens; there were 11 cases of sapremia. Of the private statistics, the most interesting are those of Dr. James Ross of Toronto, reported by his son, J. F. W. Ross,[4] and consisting of an analysis of 6777 cases attended between the years 1852–92. The youngest mother attended was a girl of $15\frac{1}{2}$ years, and the oldest a woman of 50 years. 39 mothers perished, or 1 in $173\frac{30}{39}$, 7 dying from puerperal sepsis; there was 1 case of uterine rupture; 411 children were lost,

[1] Am. Gynæc. and Obst. Jour., May, 1896.
[2] Edinb. Med. Jour., Apr., 1895.
[3] Am. Gynæc. and Obst. Jour., Feb., 1896.
[4] Am. Jour. Obst., Sept., 1895.

or 1 in $16\frac{201}{411}$; there were 7 cases of brow-presentation, 25 of face, and 35 of transverse presentation. Of twin cases there were 106, or 1 in $63\frac{99}{106}$; there was 1 case of triplets, the children being all females, presenting by the breech. There were 18 cases of placenta prævia, 1 patient and 15 of the children dying. Eclampsia occurred in 11 cases, the patient dying in 2 cases, and 2 of the children perishing. In 22 cases there was prolapse of the cord. The forceps was used 491 times, or once in $13\frac{394}{491}$ cases. Venables[1] records 1000 cases of confinement. In this number uterine hydatids occurred once, and tubal pregnancy once. There were 4 cases of placenta prævia and 3 of eclampsia; there were 3 cases of face-presentation and 2 transverse cases. The forceps was used in 41 cases. Sawyer[2] reports 270 cases of labor with 1 death (from uterine rupture). Staples[3] records 1092 cases personally attended during the past 33 years. There were 18 cases of twins in this number. [Much valuable statistical information is lost in many instances by a failure to systematically record the points of vital interest occurring in an extensive obstetric practice.]

Asepsis in Labor.—[The importance of asepsis in the practice of obstetrics is rapidly becoming more generally appreciated, as is indicated by the large number of papers upon this subject. The methods adopted by the various maternity institutions are practically the same, with here and there some innovation that may or may not still further contribute to the safety of the patients. The most practical suggestions that have been gleaned from the literature are as follows:] Lusk[4] advocates, in order to have as complete asepsis as possible, removal of all the hair from the external genitals. In regard to the employment of the douche afterward, he considers that it is not only unnecessary, but extremely harmful, as it washes away the natural secretions that prevent the germs from developing. Lefour[5] is in the habit of having all pregnant women admitted to the lying-in hospital of Bordeaux stripped nude and bathed in soap and water containing 250 grams of sodium carbonate; they are then dressed in sterilized garments and sent to the dormitory. This bath is repeated every few days until confinement. At the onset of labor, the patient being in an aseptic condition as far as is possible, Stuart[6] is in the habit of administering a vaginal douche of Tavel's solution (made of powders of dried sodium carbonate and sodium chlorid, 2.5 and 7.5 parts, respectively, per 1000), to which is added 1% of phenosalyl.

The value of the various antiseptic agents has been determined more accurately by various observers. C. M. Groth[7] gives the statistics of the Southern Lying-in Hospital of Stockholm, where, since the last death from puerperal fever, 4000 women have been delivered, the conditions leaving nothing to be desired. For the past few years the strongest solution of lysol, the antiseptic used, has been 1% externally and 0.5% for injections. The students in mid-

[1] Boston M. and S. Jour., Sept. 19, 1895.
[2] Physician and Surgeon, Mar., 1896.
[3] Ann. Gynæc. and Pæd., Dec., 1895.
[4] Univ. Med. Jour., Sept., 1895.
[5] Nouv. Arch. d'Obstét. et de Gynécol., No. 9, 1895.
[6] Ann. Gynæc. and Pæd., Dec., 1895.
[7] Svenska läk förhand., p. 20, 1895.

wifery pay great attention to the study of external manipulation in order to restrict as much as possible internal maneuvers. Forceps was applied on account of insufficient labor-pains before the introduction of antiseptics, 24 times in 1000 cases; after the introduction of antiseptics, 18 times per 1000; during the first year in which lysol was used, 5 times; during the past 2 years, 12 times per 1000. Ahlfeld and Vahle[1] describe experiments made to ascertain the value of alcohol as a practical disinfectant in obstetric practice. The results obtained by disinfecting the hands with alcohol have been variously assigned to the solvent properties of alcohol upon the fatty tissues, thus allowing mercuric chlorid and other antiseptics to come into immediate contact with bacteria contained upon the fingers. Others have asserted that alcohol does not destroy bacteria, but coagulates the epithelia of the skin, thus hardening them without preventing the passage of germs. It has been found, however, that alcohol destroys bacteria, but that its most efficient action is exerted upon microorganisms that themselves contain water or that are found in tissues containing water. By experiment Ahlfeld found that alcohol does not act simply by dissolving fatty substances upon the fingers, because ether, which is a better solvent of fat, is not so efficient as an antiseptic. Experiments with septic germs proved that alcohol exerts a direct influence in destroying virulent streptococci. Upon dried tissues containing bacteria, and upon bacteria from which water had been removed, alcohol exerted but feeble influence. An experiment was made with amniotic membrane to determine the influence of alcohol upon such tissues when wet and when dry; the result demonstrated in a striking manner the prompt action of alcohol when the membrane was moistened. Experiments upon the hands of attendants and nurses demonstrated clearly the value of alcohol as a disinfectant. Chinosol was recommended by Kossmann as a valuable antiseptic in obstetric practice. Other authors have investigated his claims, and do not share his enthusiasm. Thus, Witte[2] states that Kossmann's experiments were incomplete, since the germicidal power of chinosol was tried only upon the staphylococcus pyogenes. He also finds, in opposition to Kossmann, that chinosol is very irritating, and that its action is accompanied by burning sensations. It has marked astringent properties, and thus is objectionable for vaginal douching. Ahlfeld and Vahle find that the germicidal power of chinosol is slight. In 48 experiments the hand became sterile only once. Cultures of the staphylococcus pyogenes grew in 3% solution of chinosol. It was further found that its poisonous properties manifested themselves mainly in disturbed kidney-action. Wells[3] calls attention to the superior value of creolin as an antiseptic for obstetric use. [While generally doing no harm, it now is becoming recognized that these so-called obstetric antiseptics are of little practical service. The plentiful use of boiling water answers every purpose to much better advantage.]

The methods of preparing the hands for attendance upon labor are many. Ahlfeld[4] recommends the following: The nails should be cut short, trimmed.

[1] Deutsch med. Woch., No. 6, 1896.
[2] Centralbl. f. Gynäk., No. 9, 1896.
[3] Phila. Polyclin., iv. 1895.
[4] Deutsch. med. Woch., No. 51, 1895.

and smoothly polished, and scrubbed for 3 minutes with soap, brush, and warm water; then the hands should be washed in clean boiled water; they are then carefully rubbed in 96% alcohol with a piece of flannel, especial care being taken that the alcohol enters well under the nails. Reinicke[1] first cleanses the hands with hot water, soap, and brush for 5 minutes; they are then brushed from 3 to 5 minutes in 90% alcohol, and afterward in an aseptic fluid, preferably mercuric-chlorid solution.

The Conduct of Normal Labor by External Examination Only.—Leopold and Orb[2] report the results of the conduct of normal labor by external examination only in 1000 cases. Errors in diagnosis occurred in 65 (6.5%). Fifty-four of these were in occipital presentation, 2 in brow, 2 in breech, 1 in twin gestation; while in 6 cases of face-presentation an error was made in diagnosticating the entire number. In 168 cases contracted pelvis was diagnosticated. The writers show by statistical comparison of series of cases that palpation may be relied upon to determine a most important point—namely, the presence or absence of descent of the fetus into the pelvis.

Rectal Examination of Pregnant and Parturient Women.—Beckman[3] claims that he has tried this method with great success in 100 parturient women, the details of the pelvis and cervix being easily made out. The length of the pregnancy and state of the bladder could not be determined in 7% of the cases, and the fontanels and sutures could not be felt in 28%, but this was less important, since the position of the fetus could easily be detected by external examination, and especially by auscultation. It was always possible to distinguish the occipital from the frontal portion of the head. The advantage of rectal examination, he urges, is that infection through the genitals is avoided, the only objection being that sometimes examination through the vagina may become necessary, and that infection may occur through the examining finger. [The method is an uncleanly one and will never become general.]

The Height of the Fundus Uteri at Various Stages of Labor.—Fothergill[4] has measured the distance from the fundus uteri to the upper margin of the pubic joint during the first stage of labor and during the second stage. He also measured the breadth of the uterus in the different stages, as well as its length. His results showed that the fundus rises $\frac{3}{10}$ in. before birth; the uterus becomes narrowed laterally $1\frac{1}{10}$ in. before labor ends, while the measurement from the fundus to the pubes lessens 1 in. before birth. The length of the parturient canal is not shortened before delivery; as the child passes through the uterus into the vagina the womb grows narrow, while as labor advances the uterus is contracted anteroposteriorly. The cubic contents of the uterus are lessened. The fundus does not sink before the birth of the head.

The Maternal and Fetal Blood at Birth.—Elder and Hutchison[5]

[1] Arch. f. Gynäk., 1895, Bd. xlix. H. 3.
[2] Ibid., 1895, Bd. xlix. H. 2.
[3] Buffalo Med. Jour., Oct., 1895.
[4] Edinb. Med. Jour., June, 1895.
[5] Ibid., Aug., 1895.

reported before the Edinburgh Obstetrical Society the result of a series of observations on the blood of mothers and healthy children immediately after birth. They obtained the blood from the umbilical cord when it was cut, and from the lobe of the mother's ear during the latter part of the first or during the second stage of labor. They arrived at the following conclusions: (1) The blood of the newly-born child is relatively richer in red corpuscles than that of the adult by 350,000 to 500,000 per cmm. (2) For a short time after birth—up to about 2 days—the red corpuscles seem to increase in number. This is probably due to the fact that the total volume of blood is less, from the fluid lost from the body during this time being in excess of that absorbed. Thus concentration of the blood is produced. After the second day or so the red corpuscles gradually decrease. (3) The number of red corpuscles varies much more than in adults, probably because of greater variations in the total volume of the blood. (4) At birth there is always present a considerable number of nucleated red corpuscles. They vary, however, in number in different cases. (5) About the sixth month of intrauterine life the number of nucleated red cells is very much greater than at birth. They probably rapidly decrease in number during the latter months of pregnancy, and altogether disappear from the blood in a few days after birth. (6) The blood of the newly-born child is relatively much richer in hemoglobin than the blood of the adult. (7) The individual red corpuscles are richer in hemoglobin than those of the adult. (8) The blood of the mother at parturition is anemic. (9) In any individual case the blood of the mother is considerably poorer in red corpuscles per cmm. than that of her child, and it is still more deficient in hemoglobin. (10) Both the blood of the mother and that of the child contain a larger number of white corpuscles than normal adult blood. The blood of the mother may be quite as rich in white corpuscles as that of the child. (11) The blood of the child contains a distinctly larger proportion of lymphocytes and a distinctly larger proportion of neutrophile leukocytes than the blood of the adult; the number of eosinophile cells seems to be slightly deficient. (12) At the sixth month this excess of lymphocytes is probably even more marked than at birth; they probably decrease during the later months of pregnancy. (13) After parturition the number of white corpuscles in the blood of the mother (at least of those who suckle their children) decreases markedly in a few days.

The great difference between the constitution of the blood of the mother and that of her child would altogether dispose of the idea of any mixing of their bloods, even if histologic investigation had not already proved that this did not occur. There can be no doubt that the excess of hemoglobin, and consequently of the preponderance in oxygen-carrying power, on the part of the blood of the child, must be one of the most important means by which its metabolism is carried on as it is. When it is remembered that the child's blood can only be oxidized indirectly through the blood of the mother, and is consequently in a possibly comparative state of cyanosis, it can be seen that a great quantity of red corpuscles is valuable for the child to compensate for

this. Handfield-Jones[1] lays stress upon the fact that the heart-muscle after labor is left in a tired and exhausted condition; also that the emotional effects of excitement, and possibly fear, must tell unfavorably on the nervous supply of the organ; there is also at this time the existence of a suddenly diminished arterial pressure and increased venous pressure, predisposing to cardiac syncope. During the process of involution, likewise, there occurs a fatty degeneration of the hypertrophied cardiac muscle, and this process is occasionally carried too far. Williams and Cutler[2] report their observations as follows: They consider the low rate of the pulse after delivery to be exaggerated in many text-books. They found that in 11% the pulse remains stationary, while in 13 it was increased after the end of the third stage. It was found that the length of labor exerts some influence upon the pulse, and also that chloroform makes the pulse higher after delivery. In 19 cases of postpartum bleeding the pulse rose on the average 19 beats per minute; the tension is usually above normal during labor, and, should it be below normal, there is danger of bleeding. Respiration is slightly slower after delivery. The average temperature during the lying-in state was between 98° and 99° F. Rupture of the perineum did not influence the temperature, unless septic infection occurred.

Analgesia in Labor.—Pleas for the use of anesthetics in labor are offered by Simmons[3] and Earle.[4] Earle prefers chloroform, which may be used advantageously not only at the close of the second stage, but at the close of the first as well. It eases the patient, relaxes the perineum, and does not affect the fetus even in prolonged use. In the first stage Simmons employs chloral with excellent results. He has also frequently employed morphin in the first stage of labor with gratifying results.

The Third Stage of Labor.—Ahlfeld[5] proposes some more definite nomenclature for the proceedings in the period of the after-birth. This is intended to clear up and make definite the terms used with reference to the third stage of labor, when operative interference becomes necessary. He proposes to define as *Credé's procedure* the gentle friction of the uterus or its control immediately after the birth of the child, so as to express the placenta, by compression, into the vulva as soon as one or more pains come on. This pressure is *Credé's manipulation.* So as to differentiate this from the pressure by means of which a placenta lying in the vagina is expressed, Ahlfeld designates the latter as *expressio placentæ* or *squeezing out of the placenta.* Ahlfeld defines *expectant methods* as those in which the uterus is not rubbed, and, where possible, is not touched at all. He also differentiates *Removal* of the placenta from the vagina, *Expulsion* of the placenta from the uterus, and *Separation with expulsion* of the placenta. *Revision* of the *uterus* means the examination of the uterine cavity after delivery of the placenta and the removal of retained products of conception.

[1] Loc. cit. [2] Trans. Obst. Soc. of London, 1895, vol. xxxvii. No. 1.
[3] Am. Gynæc. and Obst. Jour., Aug., 1895. [4] Chicago Clin. Rev., Apr., 1896.
[5] Centralbl. f. Gynäk., Bd. xix. H. 8, 1895.

A. H. Freeland Barbour[1] in an elaborate paper shows the results obtained in the last few years from a study of frozen sections in their bearing on the mechanism of labor. Twenty-three reports of these sections at or near full term are collected and studied. He concludes that "frozen sections have greatly extended the scope of our investigation of the process of labor beyond what was possible by clinical study, and, while the method has its limitations, the results stand among the most important contributions made during the last half-century to the science of obstetrics. The pelvis lined with soft parts has replaced the bony pelvis in our discussion of the mechanism of labor. The relations of the peritoneum have been defined, and the position and behavior of the bladder made visible. The whole idea of a lower uterine segment has grown up round Braune's section and the subsequent ones. The behavior of the uterine contents in labor has also become a matter of direct observation. The old idea of the fetus as a more or less rigid body has been displaced by one that emphasizes the plasticity of the fetal mass, the nonrigidity of the spine, and the mobility of the head on the shoulders. The retrogressive changes in the puerperium, in so far as these affect the bulk of the uterus, and the height of the fundus and the length of the canal have been made the subject of exact measurement." [These studies afford an explanation of the well-known clinical fact that patients do not bleed until the third stage has begun. If the old view were correct that separation takes place during the second stage, there should be bleeding during that stage, but there is none. They also give us a *rationale* of the arrest of hemorrhage. The vessels are ligatured by muscular retraction before the placenta is amputated. The third stage to a certain extent resembles the second, the uterus now operating on the placenta as it formerly did on the fetus.] Nichols[2] suggests a new and rational method of delivering the placenta by "axis-adjustment;" that is, he makes the axis of the doubled-up placenta —that passing through the points of reduplication of its edges, these points corresponding to the poles of the fetus—correspond to the axis of the uterus —that line passing from the center of the os to the center of the fundus. If the axes correspond, placental delivery is easy; if they do not correspond, the placenta is retained *in utero*, and this he terms "*placental cross-birth*." In such a case he corrects the position of the structure by an operation which he terms *placental version*, the latter being accomplished by three methods—external, internal, and combined or bipolar, the external method being the preferable one.

Stubbs[3] records the case of a patient who in August, 1895, complained that her menstrual flow was 6 weeks overdue. She suffered from pain, faintness, nausea, and slight vaginal flow. Pelvic examination showed an enlargement of the left Fallopian tube and cornu. In November the tubal mass was markedly larger and the uterus considerably increased in size. The patient then visited another physician, who introduced a sound. About 10 days later

[1] Edinb. Med. Jour., Aug., Sept., Oct., 1895. [2] Med. Rec., Aug. 17, 1895.
[3] M. and S. Rep., Feb. 15, 1896.

the labor began, and after 4 days the fetus was expelled. Vaginal examination now showed a mass still present in the tube and cornu, although smaller than at the first examination. After waiting 8 days for the placenta to be expelled spontaneously, it was removed by the fingers and curet from a curious constricted opening on the left side of the uterus. [It is probable that this was a case of implantation of the placenta in the rudimentary horn of a bicornuate uterus, rather than in the lumen of the tube itself, as the author was inclined to believe.]

A New Method of Ligating the Umbilical Cord.—Budin[1] has devised a new method of ligating the umbilical cord with strong linen thread, as follows: The cord is first tied by encircling it with the ligature and tying firmly in a surgeon's knot; one portion of the ligature is then passed half round the cord, and the two strands are again tied perpendicularly to the first, the knot being brought down upon the cut end of the cord about at its middle. This results in the separate ligature of one-half of the cord containing the umbilical vein and one of the arteries. The ligature is then passed in a similar way about the other umbilical vessel, and the knot again tied in the middle of the cut end.

Treatment of the Puerperant.—Barker[2] suggests that the puerperal woman is injured by being maintained for too long a period in the recumbent posture. He thinks that after the fourth day she should be allowed to assume the semi-recumbent posture. When there have been produced minor injuries (contusions) of the external genitalia he[3] employs the hot medicated pack (hot water, to a pint of which are added 2 ounces of the fluid extract of witch-hazel, a napkin being saturated in this and applied to the parts). This may be changed every 15 minutes for the first 3 hours, and afterward every ½ hour to 1 hour for 6 hours. To hasten involution Gill Wylie[4] recommends the use of boroglycerid pledgets in the vagina.

Involution and its Anomalies.—C. K. Broers[5] in his inaugural thesis at the University of Leyden considered the subject of puerperal involution of the uterine muscles, basing his conclusions on careful study of the rabbit at various parts of the postpartum period. He expressed the opinion that at the beginning of the puerperium the diminution in size of the uterine muscle is to be attributed to a glycogenic effusion of the hypertrophied muscular fibers, with a resorption of the edematous intermuscular fibrous tissue. Probably the glycogen, having undergone a chemical modification, is transported by the lymphatics. This effusion of glycogen, which begins in the first hours after delivery, is the sole factor in the diminution of the musculature—a diminution which follows a progressive course until the end of the first day, when a new factor is added. Small fat-globules collect in the muscular cells, and little by little increase in size and become confluent. They leave the cells and are temporarily deposited in the inter-

[1] L'Obstétrique, 1896, No. 1.
[2] N. Y. Med. Jour., July 6, 1895.
[3] Am. Jour. Obst., Aug., 1895.
[4] Med. Rec., Sept. 4, 1895.
[5] Univ. Med. Jour., Oct., 1895.

muscular fibers, to be finally expelled on the fifth day. Their expulsion causes a considerable decrease in the size of the muscles, which by the end of a week and a half have reached the average normal dimensions. The process in no way implies a destruction of the muscular fiber, the fat which is formed being transported by the lymphatics and vessels so slowly that at the end of nearly 5 weeks it has not entirely disappeared. The same process also goes on in the coats of the arteries, the lumina of which occasionally undergo considerable contraction—so much so that an artery may sometimes be entirely closed from proliferation of its internal coat.

In discussing the atrophic uterus and subinvolution after labor Bossi[1] recognizes 4 varieties of atrophic uteri: 1. A uterus atrophic from arrest of development (*a*) during the embryonal period—*fetal* or *congenitally atrophic;* (*b*) at birth or shortly afterward—*infantile uterus;* (*c*) at about the time of sexual development—*adolescent uterus;* 2. A uterus atrophic from pathologic reduction of its size during sexual life, but before fecundation; 3. A uterus atrophic from pathologic reduction of its size during active sexual life, after one or more pregnancies, but from some cause independent of the last pregnancy or labor; 4. A uterus atrophic from hyperinvolution—that is to say, from a pathologic excessive reduction dating from and related to the last parturition and the last puerperium. He thinks this last variety may be due to an exaggeration of the after-pain. The symptoms noticed are a gradual decrease in the strength of the patient, progressive emaciation, and anemia. The milk becomes lessened in amount and disappears. Amenorrhea and sterility supervene. The circulation is irregular, the digestion poor, the appetite morbid. There is ptyalism. Respiration becomes difficult, sometimes to the point of dyspnea. There are headaches, nervous phenomena connected with the special senses, pains in various parts of the body, especially in the right hypochondrium, the latter symptom being almost pathognomonic of hyperinvolution. There are general weakness and profound melancholy. Locally, it will be noticed that any wound upon the cervix uteri heals with remarkable rapidity. Treatment must consist of hygienic and dietetic measures, with tonics, massage, electricity locally applied, frequent sounding of the uterine cavity, warm vaginal douches, and often measures to irritate and excite the part to the point of hyperemia.

Lactation.—Wiedon[2] has collected interesting statistics at the Freiburg Maternity. Out of 525 women in childbed, only one-half could suckle thoroughly during the first 2 weeks; 99 secreted no milk; 49 had imperfect nipples, 46 fissured nipples, and 44 insufficient secretion of milk. Only 33 suckled without unfavorable complications. Wiedon groups the breasts into 3 classes. According to the percentage of his series, good breasts give 56%; medium, 21%; bad, 11%, of rich milk. The development of the nipple bears a direct relation to the value of the breast as a secretory organ.

Wröplewski[3] has made researches into the comparative properties of casein

[1] Ann. di Ostet. e Gin., Jan., 1896.

[2] Univ. Med. Mag., May, 1896.

[3] Centralbl. f. Gynäk., No. 32, 1895.

in woman's and cow's milk. The casein differs in the two kinds of milk. In woman it contains less carbon, nitrogen, and phosphorus, but more hydrogen and sulphur. The solubility of the casein differs, and different chemical changes go on when cow's or woman's casein is submitted to gastric digestion.

Külz [1] has analyzed human milk, and in so doing has taken every precaution to prevent the entrance of air from without before making the analysis. Hoppe-Seyler in 1859 made out the proportions of the most abundant gases, as follows: Oxygen, 0.16%, carbon dioxid, 1.88%, and nitrogen, 1.38%. More recent authorities give conflicting evidence. Setschenow and Pflüger found carbonic acid in much larger proportion (6 or 7%). As the result of careful analysis of 5 samples from 3 women, Külz has arrived at very uniform proportions; in fact, roughly speaking, the gases stand at, oxygen, 1.5%, carbon dioxid, 2.5%, and nitrogen, 3.5%. In all 5 samples the gases kept the same figures as above indicated, with but slight variation in decimals.

Worcester [2] describes work done in Dresden for the purpose of rendering cow's milk as nearly as possible an equivalent for mother's milk. The plan followed is based upon the belief that cow's milk is poor in lactalbumin. White of egg is taken as most closely resembling lactalbumin and being easy to obtain. The white of 1 egg is added to 1 pint of cow's milk and 1½ pints of water. To secure the necessary fat, the milk should contain 9½% of fat, while sugar is added in the form of 13 drams of milk-sugar. Under strict precautions for asepsis the white of egg is thoroughly beaten with the milk-sugar, and the 1½ pints of water slowly added, stirring constantly. This emulsion is then strained through fine linen into sterilized milk. The whole should be slightly stirred or shaken and poured into a nursing-bottle. If strict cleanliness has been observed, this mixture may be kept for days or even months.

Conception during the Puerperium.—Cases of conception occurring during the puerperium are recorded by Gruber [3] and Brasseur.[4] In the latter case the second pregnancy lasted 243 days, or 27 days less than the normal. The child measured 52 cm. in length and weighed 3550 grams.

MATERNAL DYSTOCIA.

Contracted Pelvis.—Klien [5] describes a new method of measuring the dimensions of the pelvis at its outlet which he has successfully employed in the clinic at Munich. The best method of making the measurements hitherto known is that of Breisky: it consists in measuring externally the distance between the tuberosities of the ischia, and also in taking the distance from the junction of the sacrum and coccyx to the lower border of the *ligamentum arcuatum*. While this method is fairly accurate and successful, it does not give all the information desired. With a view of increasing the accuracy of

[1] Zeit. f. Biol., vol. xxxii. part 2, 1895.
[2] Boston M. and S. Jour., No. 12, 1895.
[3] Der Frauenarzt, July, 1894.
[4] Buffalo Med. Jour., Oct., 1895.
[5] Monatsh. f. Geburtsh. und Gynäk., 1895, Bd. ii. H. 3.

the measurements, Klien has devised an instrument composed of a cross-bar terminating in two disks which are placed upon the tuberosities of the ischia. To the middle of this bar is joined what is essentially a pair of compasses, having a graduated scale fastened across them. With the patient lying upon her back the two disks are pressed firmly upon the skin opposite the tuberosities of the ischia, while the attached calipers or compasses are used to outline a rhomboidal shape extending from the subpubic ligament to the point of the coccyx. The result is a rhomboidal outline, the various dimensions of which can be computed by the formulæ applicable to a rhomboidal figure. Klien utilized this instrument to advantage in measuring the pelvis of a woman who had fallen in childhood, breaking her leg and dislocating her hip. As the patient grew to womanhood the result of this injury was an obliquely contracted pelvis. It was possible by Klien's method to measure accurately the outlet of this pelvis in the manner described.

Flint[1] summarizes the records of 6000 cases of pregnancy in which contraction of the pelvis was noted in 654, or $10\frac{9}{10}\%$. Comparison of the measurements of the head, weight, and length of the child with the measurements of the pelvis gave no definite results. In $86\frac{8}{100}\%$ (563 of the 654) delivery was spontaneous. In all of these cases the contraction was slight, the true conjugate being $3\frac{1}{2}$ to $3\frac{1}{3}$ in. In 91 cases operative interference was necessary. Of 663 children, 31 were stillborn, a total infant mortality of $5\frac{58}{100}\%$. In contractions of this degree forceps or version may be selected. Schatz[2] says that the clinic at Rostock shows 9% of narrow pelves; 3% uniformly narrow; $4\frac{1}{2}\%$ flat (nonrachitic); 1% flat and rachitic. 70% of all cases in flat pelves are delivered without aid. Version yields 75% of living children in simple flat pelves, the best results being obtained if version be performed before the rupture of the membranes and with a dilated os. Compression of the skull is attended with less fatality than very high extraction with difficult arm delivery. Leopold[3] favors the assumption of Walcher's hanging position after the extraction of the arms, and disapproves of version in primiparæ if avoidable. Tscherneffsky[4] gives the statistics of 24 cases of intrauterine version by the feet performed by him since 1890 in cases of narrow pelves. The result was 11 living children, to whom should be added 2 more who were born alive, but could not be resuscitated, 10 stillbirths, and 2 not born alive. The average weight of the children born alive was 3851 grams; the maximum weight, 4700 grams. The after-coming head was perforated in 3 cases. Six of the patients were primiparæ, and the maternal mortality was 1. Tscherneffsky believes that the after-coming head adapts itself better to the conditions of a contracted pelvis than when that part precedes the breech. Ahlfeld[5] believes that a simple flat pelvis is much rarer than is generally believed, many so-called pelves being in reality instances of flat rachitic pelves. Neumann[6] reports a case of kyphosis lumbalis in a woman 26

[1] Med. Rec., 1895, vol. xlviii. No. 17.
[2] Münch. med. Woch., No. 39, 1895.
[3] Loc. cit.
[4] Nouv. Arch. d'Obstét. et de Gynécol., No. 9, 1895.
[5] Centralbl. f. Gynäk., 1895, No. 51.
[6] Wien. med. Woch., Feb. 15, 1896.

years of age, and gives the illustrations (Fig. 104). Klien[1] comes to the following conclusions regarding labor in kyphotic pelves from a study of 95 cases: Kyphotic pelves are found in labor about once in 6016 cases. They are generally developed in childhood from spinal caries. In 8% the spinal column projects over the pelvis. Both inlet and outlet of the pelvis are nar-



FIG. 104.—Kyphosis lumbalis (Wien. med. Woch., Feb. 15, 1896).

rowed from side to side and in the anteroposterior diameter. The inclination of the pelvis is diminished, while the true conjugate is almost always lengthened. The nates are flattened; 30% of all kyphotic pelves are also universally contracted. Three-fourths of the cases terminated by spontaneous labor, one-fourth prematurely. In a third of all head-presentations the position was posterior, and face-presentations were more common than in normal pelves. From 58 to 60% of the cases studied required operative interference. The mortality of the mothers in the cases most favorable for the mechanism of labor was 6.2%, in unfavorable cases 17%. The mortality of the children was about 40%. As regards treatment Klien advises the induction of labor in cases in which the distance between the tuberosities of the ischia measures from $8\frac{1}{4}$ to $6\frac{1}{2}$ cm. If the patient be not seen until the end of preg-

[1] Arch. f. Gynäk., Bd. 50, H. 1, 1895.

nancy, symphysiotomy should be done if the distance between the tuberosities of the ischia measures $5\frac{3}{4}$ cm. If a greater measurement exists, forceps can be tried. Cesarean section is only absolutely indicated when the distance between the tuberosities is less than $5\frac{1}{2}$ cm., and is relatively indicated when the distance is from $5\frac{1}{2}$ to 7 cm., if by it a living child can be obtained and symphysiotomy is undesirable.

Budin [1] gives the diagnosis of the iliofemoral pelvis—that due to congenital dislocation of the hip. The normal distance between the sole of the foot and the articular boundary line of the knee is equal to that separating the latter line from the superior trochanteric region. A line passing the two spines of the os pubis also crosses the epitrochanteric line. In dislocation of the hip the epitrochanteric line lies above the two spines of the os pubis, and may reach the iliac spine; it also lies higher on the sacrum than normally—the junction of the sacrum and coccyx. In discussion Rapin calls attention to a symptom of congenital dislocation often neglected—namely, the approximation of the posterior-inferior iliac spine to the crest of the sacrum on the affected side. Bodo [2] records a case of circular rachitic pelvis associated with double spontaneous posterior luxation of the thighs. Wassilieff [3] reports the delivery of a living child in a woman with contracted pelvis by the employment of the obstetric lever.

Puerperal Eclampsia.—Interesting cases of this complication are recorded as follows: A. D. Price,[4] 1 case, with recovery; Scadding,[5] 2 cases, with recovery; Polak,[6] 9 cases, with 2 deaths; 8 of the women were primiparæ, and in 6 the labor had begun before the convulsion appeared; 3 children were born dead; Harrison,[7] 1 case, with recovery after treatment by veratrum viride and morphin; S. S. Jones,[8] 2 cases, with recovery, treated by veratrum viride; Davis (E. P.),[9] 5 cases, 1 resulting fatally; Williams,[10] 2 cases, 1 resulting fatally; Schreiber,[11] 4 cases, 1 perishing; he employed in treatment the hot pack, inhalations of chloroform, and morphin injections; Robert,[12] 1 case, recovering after forced delivery by the hand; York,[13] 1 case, occurring in a primipara 8 hours after a natural labor; a cure followed the use of veratrum viride; Freeman,[14] 1 case, with recovery; Mackness,[15] 1 case, with recovery; J. S. Davis,[16] 1 case, treated successfully with large doses of tincture of veratrum viride; and Craik,[17] 2 cases, both recovering under pilocarpin treatment. T. K. Holmes,[18] reports a series of 47 cases with 19 maternal and 20 fetal deaths; labor was induced 9 times, with no death either to mother or child; he believes that

[1] Nouv. Arch. d'Obstét. et de Gyn., No. 9, 1895.
[2] Centralbl. f. Gynäk., No. 30, 1895.
[3] Arch. de Tocol., No. 9, 1895.
[4] Am. Gyn. and Obst. Jour., July, 1895.
[5] Canad. Pract., Feb., 1896.
[6] Am. Gyn. and Obst. Jour., Dec., 1895.
[7] Am. Jour. Obst., Sept., 1895.
[8] Med. Rec., Apr. 25, 1896.
[9] Therap. Gaz., July 15, 1895.
[10] Practitioner, Jan., 1895.
[11] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. i. H. v.
[12] Nouv. Arch. d'Obstét. et de Gyn., No. 9, 1895.
[13] Atlanta M. and S. Jour., Oct., 1895.
[14] Denver Med. Times, Oct., 1895.
[15] Brit. Med. Jour., Oct. 19, 1895.
[16] Va. Med. Monthly, Dec., 1895.
[17] Lancet, June 29, 1895.
[18] Med. Age, Feb. 10, 1896.

prophylaxis is most important, and that a diminution in the quantity of urine, the presence of albumin or of a low specific gravity, demands prompt recognition, and, if associated with nervous disturbances, pain, or anasarca, means imminent danger. S. C. Red,[1] in an experience of 9 cases with 2 deaths, classifies his cases as symptomatic, reflex, and toxic. He endeavors to treat the symptom, to remove the peripheral irritation, and to relieve the toxemia. An interesting case of eclampsia in both mother and child is reported from Schauta's Clinic in Vienna by Woyer.[2] The patient was a primipara, and was admitted to the hospital partially comatose and suffering from eclamptic convulsions. Labor was hastened by an elastic dilator, and the child delivered by version; it was asphyxiated, but was resuscitated. The mother made a gradual recovery, and left the hospital 2 weeks afterward. Five hours after birth the child was taken with eclampsia, accompanied by tracheal rales and impaired respiration. The pulse rose to 144. In all, the child had four convulsions at intervals of an hour or two, and died cyanotic with heart-failure after the fourth. The postmortem examination showed acute edema of the lungs as the only lesion present. Bacteriologic examination of the various organs and examination of the urine found in the child's bladder gave negative results. [The few cases of infantile eclampsia on record have ended fatally.] Dohrn [3] reports a very interesting case of a patient in fatal eclampsia in whom the os and cervix were so tightly closed that artificial dilatation was impossible; accordingly, Cesarean section was practised immediately after death. It was found that the fetus had perished, and apparently in a convulsion, as the jaws were tightly closed, the arms and legs bent, and the fingers drawn strongly into the palms. So rigid were the muscles that it was necessary to open the uterus widely in order to extract the child; this persisted for 16 hours after the delivery of the fetus. Postmortem examination of the child showed extravasation of blood beneath the dura and in the arachnoid spaces over the left cerebral hemisphere. Rabczewsky [4] has observed an instance of convulsions during pregnancy in which every fit was regularly preceded by transitory amaurosis, as well as by edema of the face, which was also of short duration. [Olshausen has been able to collect only 3 cases of eclampsia in which the fit was preceded by an aura, as in this case.] Abelin [5] records a case of eclampsia, with subsequent tetanus due to biting of the tongue, developing on the eighth day after delivery and terminating fatally 2 days later. [Tetanus following labor or abortion is exceedingly rare, although Venay has collected 106 such cases.] Zweifel [6] reports his experience of 129 cases of puerperal eclampsia treated in the Leipzig Clinic, and contrasts those treated by the expectant method (before 1892) with those treated actively by Dührssen's plan of emptying the uterus as soon as possible: 49 cases were treated by the former method, with a mortality of 32.6 %;

[1] Southwestern Med. Rec., Mar., 1896.
[2] Centralbl. f. Gynäk., 1895, No. 13.
[3] Ibid., No. 19, 1895.
[4] Przeglad Chirurgiczny, vol. ii., part 3, 1895.
[5] Jour. de Méd. de Bordeaux, Nov. 17, 1895.
[6] Centralbl. f. Gynäk., Nos. 46, 47, and 48, 1895.

80 by the latter method, with a mortality of 15%. After a careful study of the 129 cases, Zweifel concludes by advocating the principle of immediate delivery by operation in every case of eclampsia, by dilatation with elastic bags, and, when the cervix is already taken up, slight incisions into the os or, in cases not so far advanced, by making extensive incisions into the cervix. As the amount of blood that may be lost after these incisions cannot be estimated, venesection, which is very useful when the fits persist after the child is born, especially when the pulse is of high tension, is, unless under the same condition of the pulse, hardly advisable before delivery, although the older authorities are agreed as to the surprising effect it has in accelerating dilatation. While nothing should be given to an unconscious patient to swallow, a proper sound may be used to introduce liquid nourishment, to siphon out the stomach when desirable, or to administer weak solutions of acetic, tartaric, or citric acid, which in extreme restlessness are most beneficial. Zweifel does not consider ether contraindicated as an anesthetic. Either this or chloroform may be employed. Finally, he insists that a rigid asepsis is the more necessary, as infection favors the recurrence of the fits. [These results are especially interesting in view of a change in belief that has gradually come about in the minds of many obstetricians. Dührssen's method of incising the neck of the uterus makes delivery possible in those cases in which the pelvis is not contracted or the child not excessive in size. As has been suggested, it is safe to say that within the past year American obstetricians seeing the largest number of cases and operating most frequently have come to share the conclusion expressed by Zweifel.] Polak [1] also employs this method.

Cassaet and Chambrellent [2] have made a histologic examination of the kidneys and spleens of stillborn infants of eclamptics and of children born of eclamptics who died soon after birth. Death was found to be due to two very different causes: 1. To hemorrhagic and degenerative lesions of the placenta; in these cases the fetus died *in utero* and was often macerated at birth; 2. To histologic alterations of the spleen and kidneys resembling the lesions found in the organs of the mother. These lesions explain the great mortality in the infants of eclamptics, even when they are born living and well developed.

Boyd [3] reviews the theories of the causation of eclampsia, and emphasizes the facts that it is not common in women the subjects of chronic kidney-disease before pregnancy; that when kidney-symptoms are present they usually develop suddenly; that kidney-lesions may be absent; that albuminuria is in many cases the effect and not the cause; that it must be remembered that the kidneys are not the only excretory organs whose failure to perform elimination properly may produce eclampsia; and that ptomain-poisoning should not be forgotten. Ludwig and Savor [4] report the results of their investigations concerning the toxicity of the urine and the blood-serum of eclamptic patients.

[1] Loc. cit.

[2] Rev. des Mal. des Femmes, Oct. 25, 1895.

[3] Bull. méd. du Nord, Nov. 12, 1895.

[4] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. i. H. 5.

They observed by experiments upon animals that the toxicity of the urine in these patients varies greatly from time to time. Contrary to what might be expected, during the convulsions the toxicity of the urine is much less than at other times, while, on the contrary, the poisonous properties of the blood-serum of these cases increases markedly during the time of the convulsions. These results were obtained by injecting into animals the urine and blood-serum from eclamptic cases. Massin[1] is convinced that in the body of the pregnant patient, and especially at the end of pregnancy, there exists an abundance of but partially oxidized products, which he terms "leukomains." These are ordinarily broken up and excreted by the liver and kidneys, but in cases in which these organs are at fault these products may remain within the body of the patient. Their immediate absorption and the effect which they produce depend considerably upon the condition of the nervous system. Whatever increases the sensitiveness and irritability of the nervous system favors the absorption of this material, which is capable of producing eclamptic convulsions when in considerable amount. Williams[2] does not believe that renal disease is the sole cause of puerperal eclampsia. The points that sustain this opinion in his mind are that convulsions may occur in the absence of albumin in the urine; that in many fatal cases of eclamptic convulsions disease of the kidneys is absent or insignificant; and that puerperal convulsions are comparatively rare in persons the subjects of chronic Bright's disease prior to the occurrence of pregnancy. S. Seabury Jones[3] concludes that one is justified in believing that puerperal eclampsia is due mainly to the non-elimination from the system of the pregnant woman of toxins which are the direct and natural product of the physiologic processes incident to her condition, or to the conversion into toxins of such products and their nonelimination, and that the nervous tension of the pregnant woman predisposes to the disease; that while albuminuria during pregnancy should lead to grave apprehension, yet many women who present this symptom escape convulsions (about 7 out of 8), while convulsions may be met with in women whose urine has remained free from albumin until their onset; that he who saves 4 out of 5 women who have been attacked by eclampsia before or during labor may consider that he has been fairly successful; that we have medicines powerful for good, and that they should be given a fair trial before resorting to accouchement forcé in actual convulsions; that at a period when the fetus is viable, especially at the end of the eighth month, if the patient suffer from severe premonitory symptoms, such as anasarca, severe and persistent headache, and the eye-symptoms, and particularly if the evidences of nephritis have persisted for some time in spite of treatment, premature labor should be induced in the interest of both mother and child; that in the actual presence of convulsions we should endeavor to overcome them by the use of proper medicines and remedial measures, notably by the use of veratrum viride, morphin, chloral, and chloroform, rather than appeal to the rapid emptying of the uterus; that in veratrum viride we have a powerful remedy for good when properly used,

[1] Centralbl. f. Gynäk., No. 42, 1895. [2] Loc. cit. [3] Med. Rec., Apr. 25, 1896.

but that of Norwood's tincture it is better not to inject more than 5 to 10 minims for the initial dose, to be followed by doses of 5 minims at intervals as required to hold the pulse, and that it is well to combine it with morphin. Manton[1] has collected 8868 cases of delivery, in which number eclampsia is noted as having occurred 33 times; in not a single instance is it stated that *insanity* followed the convulsive attacks. He concludes, therefore, that insanity as a sequel to puerperal convulsions is of such exceedingly rare occurrence as hardly to deserve consideration in this connection.

[In the *treatment of eclampsia* veratrum viride still holds the place it has recently gained in the estimation of obstetricians, and the results of increasing experience give promise that it will meet the fondest expectations of the most enthusiastic.] Willis[2] reports 2 cases successfully treated by the drug, and others report repeated happy terminations under its use. Tweedy[3] does not believe that a more fatal drug could be found for uremic patients than pilocarpin, while Grinberg[4] has employed the drug successfully in 3 cases, and with fatal pulmonary edema in one case. He believes it is contraindicated in all cases complicated by pulmonary edema. Venous injections of from 1 to 2 pints of normal saline solution are recommended by Lanphear[5] and Audebert.[6] Lanphear claims that these injections dilute the toxins and increase arterial tension to such an extent as to restore the secretion of urine. In very few instances is a third injection necessary. Audebert has also employed the injections after severe hemorrhages during or after delivery or abortion; in cases of autointoxication of variable form, origin, and gravity, and of different symptoms (vomiting, nephritis), with satisfactory results; and in newborn infants, premature, feeble, or with athrepsia. He injects from 300 to 1000 ccm. in adults and from 10 to 30 ccm. in infants, selecting the flanks or the rectotrochanteric groove, and makes use of a glass apparatus with atmospheric pressure. De Goubarew,[7] professor of obstetrics and gynecology in the medical faculty of Dorpat-Yurieff, has found that in cases of eclampsia in women the application to the lumbar region of a large rubber bag filled with hot water produces excellent results. Under this treatment diuresis rapidly increases, while the albuminuria decreases, and general improvement sets in, which is soon followed by recovery. Prof. de Goubarew has had occasion to use this method of treatment in 6 patients suffering from eclampsia, all of whom recovered. The accessory measures employed in these cases were hypodermic injections of morphin, chloral enemata, warm moist wraps, rubbing with a mixture of salt, vinegar, and alcohol, purgatives, and, lastly, milk in abundance. Dührssen's method of deep incision of the cervix to facilitate delivery is growing in favor, and is presenting brilliant results in the hands of many observers, including Edgar[8] of New York. Tweedy[9] believes that chloroform,

[1] Am. Jour. of Obst., Dec., 1895.
[2] Med. News, Mar. 28, 1896.
[3] Dublin J. M. Sci., Mar., 1896.
[4] Rev. Thér., No. 10, 1895.
[5] Texas Med. Jour., Aug., 1895.
[6] Nouv. Arch. d'Obstét. et de Gynéc., No. 9, 1895.
[7] N. Am. Pract., Aug., 1895.
[8] Am. Jour. of Obst., No. 6, 1895.
[9] Loc. cit.

chloral, and potassium bromid, being powerful cardiac depressants, tend to kill in the same way as eclampsia; he says that chloroform, given when a fit is approaching, has but slight effect in lessening its severity, and by limiting the amount of oxygen reaching the lungs may actually increase this. He does not consider severe diaphoresis justifiable, as it is not always easy to accomplish, not certain in good effects, nor even safe. Pilocarpin he considers as fatal a drug for uremic patients as any, depressing the heart and increasing the saliva and bronchial secretion. Temporary good may follow its use. Drugs, stimulants, and food should not be given by the mouth. Swallowing being impossible, croton oil or saliva enters the lungs more easily than the stomach, and he considers the so-called edema of the lungs in fatal cases to be due to fluids reaching them in this way. For this reason the patient, as in anesthesia, should not be allowed to lie upon her back. The gag, by keeping the lips and teeth apart, prevents swallowing, increasing this danger. The induction of premature labor as a prophylactic is absolutely unjustifiable, as no one can say whether a case will develop eclampsia; less than 6% showing premonitory symptoms do so. He believes that induction of labor adds to the danger, because convulsions are brought on by any reflex stimulation. He advises hypodermic injections of morphin, beginning with $\frac{1}{2}$ gr., followed in 2 hours by $\frac{1}{4}$ gr., and so on until the symptoms are alleviated or 2 gr. have been given in 24 hours. If labor begin, it is hastened by forceps when the os has dilated naturally. Opium has little action on the heart or kidneys: by lessening metabolic changes it limits toxin-formation, diminishes reflexes and salivary and bronchial secretions, counteracting to a great extent the conditions that tend to kill in eclampsia. He also advocates bloodletting to relieve the kidneys, diminish bronchial and salivary secretion, diminish venous congestion, and remove toxins from the body. Stimulants or medicines should be given through a nose-tube or per rectum. Purgatives are essential; the nitrites or digitalis with spartein may be useful.

Rigidity of the Soft Parts.—Instances of *cervical dystocia*—rigidity (either spasmodic or pathologic), edematous elongation, hypertrophy, prolapse of the anterior cervical lips, thrombus of the cervix, and agglutination of the lips—have been reported as follows: Eustache,[1] a case of agglutination of the external os in a primipara of 18 years; Osmont and Chottard,[2] a case of cervical rigidity with shoulder-presentation in a woman of 32 years in her second labor; under traction the fetus was decapitated, and the woman died of sepsis on the twelfth day, after expelling spontaneously the fetal skull; Charles,[3] a case of cervical rigidity in a primipara of 19 years, with maceration of the fetus; Geyl,[4] a case of edema and prolapse of the cervix; Swift,[5] 3 cases of the same condition; Wells,[6] a case of cervical hypertrophy; T. C. Smith,[7] a

[1] Arch. de Tocol. et de Gynéc., No. 10, 1895.
[2] Ibid., No. 10, 1895.
[3] Jour. d'Accouchements, July 14, 1895.
[4] Volkmann's klin. Vorträge, No. 128, May, 1895.
[5] Australasian Med. Gaz., Sept. 20, 1895.
[6] Am. Jour. Obst., Jan., 1896.
[7] Ibid., Jan., 1896.

similar case in a primipara of 22 years, the hypertrophied infravaginal cervix protruding from the vulva at least 2 inches; and Weisenberg,[1] another case of the same condition. The etiology of obliteration of the os is obscure, among the many causes mentioned being stenosis prior to pregnancy from metritis, granulation and cicatrization of simple inflammatory, diphtheric, gangrenous, syphilitic, or traumatic origin, and the formation during pregnancy of a plastic plug or of a caducous membrane. Depaul distinguishes between obliteration of the internal and external os uteri, the latter being the most frequent. Weagly[2] recommends the following anesthetic solution for cervical rigidity: Phenolized cocain solution (3%), f℥j; trinitrin solution (2%), ♏x; strychnin sulphate, gr. $\frac{1}{6}$; listerin, f℥j; this is sprayed upon the parts. Farrar[3] has also employed cocain (10% solution) to dilate the cervix, with gratifying success. [This employment of cocain requires further confirmation before its general adoption is recommended; the danger of cocain-poisoning and of sepsis must be borne in mind.] Instances of pregnancy associated with an unruptured hymen are recorded by Braun;[4] Guerard,[5] 3 cases, 1 having a bifenestrated hymen in which the openings barely admitted a hair; and Mayer.[6] Brindeau[7] calls attention to the fact that delayed delivery in primiparæ is not due so much to rigidity of the perineum as to rigidity of the vaginal orifice. It is not uncommon to see the vulvar ring remain absolutely intact after labor, while, on the other hand, the vaginal orifice is always torn at the moment that the head is expelled. These facts were pointed out long ago by Matthews Duncan and Budin, and render it easy to understand how, if the tissues at the vaginal orifice of a primipara are unduly rigid, spontaneous delivery becomes impossible. In 2 cases reported by Brindeau the vulvar orifice was elastic, but the birth of the head was prevented by the rigid tissues surrounding the vaginal orifice. In both the tough ring of tissue was incised with scissors, and almost immediately after this the head was expelled spontaneously. The incision commenced in the middle line, and was made to extend obliquely upward for about $\frac{1}{2}$ in. After delivery it was closed with sutures.

Perineal Laceration.—Von Woerz[8] gives the notes on the injuries of the maternal perineum observed in Schauta's Clinic during the years 1892–94: Of 8495 labors, 734 resulted in perineal injuries = 8.7%. Of these, 313 = 3.68% were episiotomies, and 421 = 4.96 were lacerations. Out of 3832 primiparæ, 643 suffered injuries (16.51%); of 4663 multiparæ, only 91 (1.92%). With children of 1500–2500 gms. weight there were in 716 births 39 injuries 5.44%; of 2501–3000 gms. in 2733 births 226 8.27%; of more than 3000 gms. in 5046 births 469 injuries = 9.29%. In the institution 8103 births were spontaneous with 574 injuries 7.08%; among 3613 prim-

[1] Am. Jour. Obst., Mar., 1896.
[2] Times and Register, Oct. 5, 1895.
[3] Physician and Surgeon, Sept., 1895.
[4] Centralbl. f. Gynäk., No. 23, 1895.
[5] Buffalo Med. Jour., Oct., 1895.
[6] Am. Med.-Surg. Bull., Dec. 15, 1895.
[7] Le Progrès méd., Aug. 24, 1895.
[8] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. i. H. 2.

iparæ with spontaneous birth 498 injuries = 13.78%; and 4490 multiparæ with 76 injuries = 1.69%. Of 364 breech presentations, 51 had tears = 14% (123 primiparæ with 31.7%, 241 multiparæ with 4.97%). The great importance of forceps operations as regards perineal lacerations is shown by the fact that in 227 forceps cases 145 injuries occurred (63.87%); of 179 primiparæ 137 suffered; of 48 multiparæ, 8 had injuries—a percentage, respectively, of 75.53 and 16.66. Von Woerz concludes that the frequency of perineal lacerations during labor increases with the weight of the children born, and occurs more frequently when the perineum is not supported. Flesch[1] reports 2 unusual lacerations of the perineum. One patient was a young woman aged 19 years, who sustained an injury to the perineum consisting of a central laceration which left the posterior vaginal wall at its lower portion intact, but tore the tissues between the bowel and the vagina, the head being born apparently through the anus; the sphincter ani was entirely torn apart. The second case was one in which a resisting hymen was torn in an annular manner, being entirely separated from the surrounding tissue. In the repair of perineal lacerations Dickinson[2] employs a Hagedorn needle fixed to a Peaslee shank, as shown in the accompanying illustration (Fig. 105); with

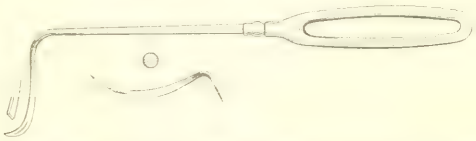


FIG. 105.—Dickinson's perineal needle (Brooklyn Med. Jour., May, 1896).

this instrument the point of the needle is readily found in the tissues and the operation facilitated.

Tumors.—Shearer[3] records a labor obstructed by an overdistended bladder containing 2 quarts of urine. Chambrelent[4] relates a case in which a bony tumor of the pelvis necessitated pelviotripsy in a woman who 2 years before had passed through a perfectly normal labor; and Lees[5] records a case of sarcoma of the sacrum necessitating Cesarean section; the patient died in 4 hours' time.

Mann[6] contributes an interesting and important paper on the sloughing of uterine fibroids after abortion and labor. While it is true that in some cases of pregnancy complicated by fibroid tumors labor proceeds without any difficulty, this is by no means the general rule. Stavely has collected the records of 597 cases in which nothing was done until labor came on. Of these, 220 died—a mortality of 37%. In 548 cases collected by the same writer 15% aborted, and in 307 of those in which the maternal mortality was noted there was 12% of deaths. This would certainly show that in cases in which there is no interference the mortality is simply frightful, and would warrant the general statement that interference is usually justified. The percentage of

[1] Centralbl. f. Gynäk., No. 45, 1895.
[2] Brooklyn Med. Jour., May, 1896.
[3] Ann. of Gynæc. and Pæd., Sept., 1895.
[4] Nouv. Arch. d'Obstét. et de Gyn., No. 8, 1895.
[5] Lancet, Nov. 23, 1895.
[6] Am. Gynæc. and Obst. Jour., Apr., 1896.

deaths where abortion occurred is so much lower than where the labor went to term that the advisability of inducing abortion would seem also to be shown. The danger after abortion, as has been proved by the records of many cases, comes principally from distortion of the uterine canal, making it impossible to entirely clear out the placenta and membranes. Small portions, being left, decompose and set up sepsis. An additional source of the sepsis is the sloughing that frequently occurs in the fibroid growths from the devitalization that follows the pressure to which the tumor has been subjected. The low vitality of these growths makes them peculiarly liable to septic invasion. Mann concludes, therefore, that should sepsis occur in a uterus after labor or after an abortion, such a uterus containing fibroids of any amount or size, unless the symptoms subside very promptly under douching and curetting, an operation for the removal either of the tumor or of the uterus and tumor should be undertaken at once.

Labor after Suspensio Uteri.—[Sufficient time has now elapsed to determine the effects of ventrofixation of the uterus upon subsequent pregnancies. The experience of observers is now very general that the operation is not so free from subsequent complications as was formerly supposed.] Graefe[1] records 2 cases in which uterine rupture was threatened, both patients being delivered by Cesarean section; in 1 case the right broad ligament had ruptured and the patient perished from hemorrhage. Goubaroff[2] records a case of labor with transverse presentation in which the uterus was very firmly adherent to the anterior abdominal wall; Cesarean section was required to prevent uterine rupture. Norris[3] records a case in which the anterior uterine wall throughout its entire length was fixed to the abdominal wall; the posterior uterine wall was so dangerously thin that delivery by the forceps was required, a dead fetus being extracted. Velde[4] records a case in which the anterior vaginal fornix was drawn up very high, the uterus sharply anteflexed, the cervix displaced to the right, the child transverse, and the uterus so contracted that version was impossible; a Porro-Cesarean section was performed, and the uterus found to be ruptured; both mother and child died. In another case a successful Cesarean section was done. Miländer[5] adds 2 cases, in 1 of which there was retention of the placenta, and in the other version was required. Among 207 cases of vaginal fixation operated upon by Dührssen,[6] 20 have had children; of these 3, or 15%, had difficult labor.

One of the most interesting and important contributions to this subject is the paper by Strassmann.[7] He writes from the Polyclinic of the Charité in Berlin. Three methods of suspending the uterus by operative procedure are recognized: one in which the uterus is suspended by shortening the round

[1] Monatsh. f. Geburtsh. u. Gynäk., 1895, Bd. ii. H. 6.
[2] Arch. de Tocol., No. 11, 1895.
[3] Am. Jour. Obst., Dec., 1895.
[4] Berl. klin. Woch., 1895, No. 36.
[5] Zeit. f. Geburtsh. u. Gynäk., 1895, Bd. xxxii. H. 3.
[6] Graefe, Monatsh. f. Geburtsh. u. Gynäk., ii. No. 6, 1895.
[7] Arch. f. Gynäk., 1896, Bd. 50, H. 3.

ligaments, a second by joining the uterus to the anterior wall of the abdomen, and the third by uniting the womb to the bladder or to the anterior wall of the vagina. So far as the results of pregnancy go in cases operated upon by these different methods, shortening the round ligaments would seem to give the best results, with the least interference with the natural mobility of the uterus during pregnancy and labor. The number of abortions occurring in these patients is also very small, and no case is found upon record in which at labor serious complications have arisen. Pregnancy seems to occur as frequently as is normal after this operation. Of the various methods of suspending the uterus to the anterior wall of the abdomen, that of Czerny and Leopold seems best, because by this method the stitches are removed and the uterus is left more mobile than in cases in which the sutures are retained. Pregnancy frequently occurs after this operation, and the number of abortions is not noticeably great. Strassmann reports the case of a multipara, aged 36 years, whose uterus had been suspended to the abdominal wound with catgut sutures in an abdominal section by which an ovarian cyst upon one side had been removed. When labor came on, the tissues at the site of the original scar were very much drawn in, while the descent of the child seemed hindered by the lack of mobility in the uterus. Not much difficulty was experienced in extracting a living child with forceps. Free hemorrhage occurred after the delivery of the child, which was only checked by carrying the uterus strongly downward into the brim of the pelvis and by placing a compress above the uterus with an abdominal binder. It was observed in this case that the adhesion between the uterus and the abdominal wall stretched readily, and that the fundus and posterior wall of the uterus were also adherent. It was observed that adhesions between serous surfaces permitted the greatest elasticity during labor and gave the best results in delivery. When, however, the uterus is attached to the wall of the vagina, the adhesion is by connective tissue and a firm and unelastic scar develops. Unless the posterior wall of the uterus distend greatly during pregnancy, abortion is inevitable. Dührssen finds that in cases becoming pregnant after this operation 25% aborted. Of patients treated for retrodisplacements with pessaries but $16\frac{6}{10}\%$ aborted, while of patients treated by fixation of the uterus to the vagina $27\frac{2}{10}\%$ aborted. If retroversion of the uterus be compared with other diseases of the uterus, it is found that retroversion offers the least obstacle to conception. It is possible for the uterus to become separated from the vagina during pregnancy. If it does not, the uterus must become greatly distended in its posterior wall.

Strassmann describes 2 cases of labor in patients in whom the uterus had been attached to the anterior wall of the vagina. In the first case the cord prolapsed, the mouth of the womb was drawn upward and backward, while the anterior wall of the vagina was forced downward and very greatly distended. In this sac lay the right shoulder and arm. A difficult version made possible the delivery of the child, followed by severe hemorrhage. In this case, as retraction of the uterus did not take place, it was necessary to carry

it down into the pelvis and to retain it there by a pad and bandage. The patient made a good recovery. The second case reported is that of a patient from whose uterus a small fibroid had been removed, and the womb attached to the anterior wall of the vagina. At labor it was found that it was very difficult to empty the bladder; the mouth of the womb was drawn very strongly upward and backward, the child being in shoulder presentation. Although dilatation was advanced by elastic dilators, it was impossible to make version because of the danger of rupturing the uterus. An eclamptic attack supervened and tetanus of the uterus gradually developed. The anterior vaginal wall formed a sac or pocket, and the posterior wall and posterior portion of the lower uterine segment were greatly distended. Under anesthesia it was found impossible to perform version or craniotomy. Abdominal section was accordingly done, the uterus amputated, and the stump fastened to the abdominal wound. The patient died of shock. On postmortem examination a laceration of the vagina was found between the anterior lip of the uterus and the point of fixation of the fundus. Some hemorrhage had occurred from the region of the right broad ligament into the abdominal cavity.

In view of the complications arising at labor Strassmann would limit suspension of the uterus to Alexander's operation or to a ventrosuspension by bringing together serous surfaces and removing the stitches. In view of the fact that many cases can be cured by pessaries and other methods of treatment, he would avoid, if possible, suspension of the uterus in women who are likely to bear children.

Dystocia following Vaginofixation.—Among the many recent contributions to the literature of this subject is that of Wertheim.[1] He found that out of 37 cases of vaginal fixation of the uterus, 3 had subsequently become pregnant. One of these terminated in abortion at 4 months, another in normal labor after a normal pregnancy. The third patient was one in whom the tissue between the bladder and the uterus had been opened and the uterus had been directly united with the vagina. Before the pregnancy the fixation of the uterus was a remarkably firm one. As pregnancy progressed the vagina was drawn up with the growing uterus, forming a diamond-shaped area, accompanied by the gradual ascent of the vaginal portion of the cervix. Fearing complicated labor, the patient was instructed to enter the clinic upon the onset of labor. Upon examination, the fetus was found in a transverse position, the head upon the right side, the fetal heart-sounds near the umbilicus. The anterior wall of the vagina was drawn up behind the symphysis, so that the scar could scarcely be felt. The cervix was so high that it was necessary to introduce the entire hand to reach it. The anterior lip of the cervix was thickened, the posterior lip very much thinned. But little of the uterus remained within the pelvis. The round ligaments on both sides could plainly be felt converging toward the middle line at the region of the umbilicus. The patient was a multipara, and had strong labor-pains, in spite of which the birth did not advance. The

[1] Centralbl. f. Gynäk., 1896, No. 2.

cervix dilated very slowly, the anterior wall of the uterus being drawn down above the symphysis. It was necessary to hasten labor on account of the great distention of the posterior wall of the uterus, which threatened rupture. Under deep anesthesia combined version was performed and a foot drawn down. Three hours afterward a living child was delivered. Immediately after labor the uterus was examined by the hand; the thinning of the posterior wall of the womb was very remarkable, and the vagina seemed to pass into the uterus without appreciable distinction. The patient made an uninterrupted recovery. On examination afterward the attachment of the uterus to the anterior vaginal wall was found in no way weakened.

Rühl[1] thinks that the difficulties attending parturition after vaginofixation have been exaggerated. He has performed vaginofixation 235 (*sic*) times, and is well satisfied with the results. He had the opportunity to observe 10 cases that subsequently became pregnant and were delivered at term. Of this number 7 were delivered naturally and 3 by podalic version, with favorable results to mothers and children. The chief obstacle to delivery, in Rühl's opinion, is the tense, hard anterior lip of the cervix, which is prevented from dilating. Delivery can be made easy by incising the ring that is formed by this unyielding tissue. [These results differ widely from the majority.]

Rupture of the Uterus.—Fatal cases are recorded by Doléris and Bonnus,[2] Tighe,[3] Baldwin,[4] Wilkinson,[5] Townsend,[6] Albers-Schönberg,[7] Marx,[8] 2 cases, and Cecil,[9] a case of separation of the vaginal attachment to the uterus with expulsion of the fetus into the abdominal cavity. Recoveries after uterine rupture are recorded by Reusing,[10] Quesnier,[11] Fenner,[12] and Cholmogoroff.[13]

Sänger[14] at the Sixth Congress of German Gynecologists at Vienna proposed a classification for rupture of the uterus. In his first group he places simple rupture, complicated rupture, multiple rupture, fissures, bruising (by pressure), and rupture caused by the presence of neoplasms. The second group comprises ruptures produced during pregnancy, those produced after delivery, and postmortem rupture (a case of Zweifel's). In the third group are placed spontaneous ruptures (that is, those due to anomalous delivery), ruptures produced by operative interference or some traumatism from within, and ruptures caused by external traumatism. A small group includes ectopic pregnancy (tubouterine pregnancy, pregnancy in one horn of a bicornate uterus). He believes that all possible ruptures can be included in these groups. The predisposing causes of rupture of the uterus are as follows: 1. *Acquired predisposing causes:* Cicatrices due to old tears or Cesarean section; thinning out of the cervix; thinning or atrophy limited to the muscle of the uterus; atrophy of the entire uterus (tuberculosis, morphin habit, Basedow's disease),

[1] Centralbl. f. Gynäk., Feb. 8, 1896.
[2] Jour. Méd. de Paris, Apr. 12, 1896.
[3] Dublin Jour. of Med. Sci., Mar., 1896.
[4] Brooklyn Med. Jour., Mar., 1896.
[5] Lancet, June 6, 1896.
[6] N. Y. Med. Jour., Feb. 1, 1896.
[7] Centralbl. f. Gynäk., xviii. 48, 1895.
[8] Am. Med.-Surg. Bull., Nov. 15, 1895.
[9] Ibid., July 15, 1895.
[10] Centralbl. f. Gynäk., xix. 21, 1895.
[11] Ibid., No. 51, 1895.
[12] Ibid., No. 2, 1895.
[13] Zeit. f. Geburtsh. u. Gynäk., Bd. xxxi. H. i., 1895.
[14] La Sem. méd., 1895, p. 253.

atresia of the cervix, placenta prævia. 2. *Predisposing congenital causes:* Thinning of a part of the wall of the uterus (uterus arcuatus, incudiformis, unicornis, and bicornis), and in atrophy of the entire uterus and vagina (infantile uterus). 3. *Abnormal weakness of the wall of the uterus*, due to a pathologic condition of the tissues. This condition can be caused by septic infection before or during labor, hemorrhagic infarctions, chronic interstitial metritis, tuberculosis, syphilis, myomata, carcinomata. 4. *Abnormal weakness of the tissue*, due to a degeneration of the muscular tissue. This includes both fatty and hyaline degeneration. Passing to the mechanism of rupture of the uterus, we find it very simple after Bandl has made us familiar with it. Rupture is produced if there is a disproportion in the three factors—the genital canal, the expelling force, and the object to be expelled. It takes place when the genital canal is impassable at its lower end, and is due to the drawing up of the muscular fibers and both active and passive hyperdistention and thinning of the median segment of the uterus. The primary causes of rupture of the uterus may be given as uterine contractions and internal and external traumatism. The secondary causes are—(1) Obstructions in the bony pelvis; (2) obstructions in the soft parts, rigidity of the cervix, bicornate uterus, stenosis of the cervix or vagina, malposition of the uterus, and abnormal contractions of the uterus; (3) abnormal resistance of the membranes, abnormal positions or presentations, anomalies of labor.

[The old method of treating a ruptured uterus was purely expectant, but the good results recently obtained from operative procedures have brought them into general use. The two procedures mostly employed are—drainage through the vagina and suture of the uterus after abdominal section.] Fritsch[1] states that Krouer's statistics show that the afebrile (aseptic) cases do well with any treatment or no treatment, while the septic cases do badly whatever treatment is adopted. When a rupture of the uterus is seen 5 or 6 hours postpartum danger of hemorrhage is over, and a conservative course of treatment is best. The peritoneal cavity should not be washed out unless sepsis is present. Hysterectomy for this condition should never be practised, except in cases in which the uterus is septic or contains one or more fibroids.

Inversion of the Uterus.—Cases of this rare accident are reported as follows: Hirst,[2] 3 cases in 10 years' time; Matheson,[3] 1 case, followed by severe hemorrhage; J. H. Morgan,[4] 1 case of complete inversion of the uterus due to traction in the removal of the placenta; Beckmann,[5] 1 case of complete inversion in a primipara of 23 years after a rapid spontaneous delivery; Crouse,[6] 1 case; Himmelsbach,[7] a case of chronic inversion of some years' duration; W. H. Skene,[8] a case of chronic inversion of 7 months' standing which had resisted all efforts at reduction by the ordinary methods, but was cured by Thomas's operation, which consists in opening the abdomen, dilating

[1] Med.-Chir. Centralbl., No. 24, 1895.
[2] Am. Jour. Obst., Apr., 1896.
[3] Brooklyn Med. Jour., Aug., 1895.
[4] M. and S. Rep., Mar. 14, 1896.
[5] Zeit. f. Geburtsh. u. Gynäk., Bd. 31, H. 2.
[6] Med. News, June 8, 1895.
[7] Ibid., Aug. 24, 1895.
[8] Brooklyn Med. Jour., ix. No. 11, 1895.

the cervix from above, and pushing up the uterus by a hand in the vagina; A. A. Davis and C. W. Packard,[1] a case of 5 days' standing successfully treated, although the patient died within the month of pelvic peritonitis and metritis; Anst-Lawrence,[2] a case of 3 months' duration reduced by means of a repositor; Herman,[3] a case of chronic inversion, in which the treatment by Aveling's repositor was effectual, but produced a limited slough of the uterus; the organ was subsequently reduced. Herman remarks that there are two important points to bear in mind when applying continuous elastic pressure for inversion: the pressure must act in the line of the axis of the inverted uterus, and likewise of the axis of the pelvic brim, and there must be effective counterpressure. Again, the pressure must be carefully regulated, and the apparatus replaced in position as often as the restlessness of the patient makes it necessary. If these precautions are taken, the inversion will usually be reduced in a few days. Fullerton[4] records 2 cases of chronic inversion—in 1, a woman 67 years of age, the inversion being associated with a procidentia uteri, necessitating a complete extirpation of the organ. Verchère,[5] when all means have failed to reduce an inverted uterus, is of the opinion that it is best to perform vaginal hysterectomy. Muzio Pazzi,[6] in a study of this accident concludes: 1. That there is nothing new to add in the way of classification, diagnosis, prognosis, course, or treatment of recent puerperal inversion. 2. In regard to the pathologic anatomy it will be necessary to study the modifications of the uterine structure caused by pregnancy, labor, and the puerperal state. 3. There is nothing to be added to the symptomatology, except to note that inversions unaccompanied by hemorrhage may be explained by a hyperexcitability of the sympathetic system which distributes branches to the uterine vessels (vasoconstriction). 4. The partial or total uterine inertia that follows parturition must not be confounded with structural weakness of the uterus. 5. Inversion is due to two causes—the one predisposing, and the other determining. 6. The determining causes are so many that the mechanism of the production of inversion cannot be arbitrarily determined, but must vary in different cases.

Subcutaneous Emphysema during Labor.—Subcutaneous emphysema occurring during the second and third stages of labor and causing enormous distention of the face, neck, and thorax as far as the third rib, has been observed by G. L. Freeman,[7] and at a meeting of the Paris Obstetrical Society (Jan., 1896) Macé reported a case in which, about 2 hours before the child would have been expelled, the patient suddenly felt a pain in the left breast; then rapidly the neck and cheek became the seat of tumefaction to the extent of interfering with the movements of the eyelids. To prevent the aggravation of these symptoms by the efforts of the patient the labor was terminated by the application of the forceps. The emphysema

[1] Med. Rec., No. 17, 1895.
[2] Brit. Med. Jour., Mar. 9, 1895.
[3] Lancet, May 30, 1896.
[4] Am. Gynæc. and Obst. Jour., May, 1896.
[5] Nouv. Arch. d'Obstét. et de Gynécol., No. 9, 1895.
[6] Milan, Leonardi Valliardi, pub.
[7] Lancet, Mar. 14, 1896.

disappeared in about 2 weeks. Macé called attention to the rarity of this condition.

Sudden Maternal Death.—Postmortem Cesarean section with the extraction of a living child is reported by Hoffmann[1] and E. P. Davis.[2] Remy[3] advises in case of sudden death of a pregnant woman that an effort be made to save the life of the child. Three plans have been suggested: (1) to perform postmortem Cesarean section; (2) to do Cesarean section while the mother is yet alive; (3) to employ means to expedite labor and to extract the child by the natural passages as speedily as possible. Prunshuber's statistics show that when the mother is allowed to die before the child is extracted by abdominal section only about 5% of the children survive. Puech's statistics are somewhat more favorable; but there can be no doubt that the chance of obtaining a living child under these circumstances is very small. The performance of Cesarean section upon a dying woman who is unable to give her consent to the operation is undoubtedly open to sentimental objections. Gusserow and Manasse consider that the operation is justifiable under the following conditions: (1) when it is clearly proved that the mother is about to die, and (2) that the child is alive. Remy favors the plan of rapid dilatation of the cervical canal and extraction of the child per vaginam. Violent measures should be avoided, and the dilatation should be proceeded with as slowly as the condition of the mother will permit. The cervix may be dilated by means of Champetier de Ribes's bag or by the hand alone. If traction is made upon the bag, dilatation may be produced in less than half an hour.

FETAL DYSTOCIA.

Occipitoposterior Position.—When the head is above the brim, Currier[4] states that it is quite possible in some cases to rectify the position with the hand, the vectis, or the fillet—this, of course, in wide pelves; forceps may then be applied and the head extracted. If the head is in the pelvis, several methods are available—either traction with the forceps, perforation (if the child be dead or the head very large), or symphysiotomy. Warren[5] summarizes plans for the delivery of occipitoposterior positions as follows: In the first stage—1. As a prophylactic, the knee-chest posture; 2. with good flexion, temporizing; 3. manual version forward; 4. podalic version; 5. temporizing, and later low forceps; and 6. high forceps at the brim. In the second stage—1. Flexion with the finger and descent with the vectis or forceps; 2. rotation forward with the forceps; 3. reversed forceps; 4. forceps. Baldwin[6] urges manual interference in these cases, as suggested by Parry in 1873. He reports 8 successful cases and 1 partially so, and emphasizes the absolute necessity of complete chloroform narcosis before attempting to elevate the presenting part. Rosenberg[7] prefers to apply forceps, making the

[1] Centralbl. f. Gynäk., 1895, No. 50.
[2] Canad. Pract., Feb., 1896.
[3] Jour. de Méd. de Par., June 30, 1895.
[4] Am. Med.-Surg. Bull., Jan. 25, 1896.
[5] Am. Jour. Obst., Mar., 1896.
[6] Columbus Med. Jour., Dec., 1895.
[7] N. Y. Polyclinic, Jan. 15, 1896.

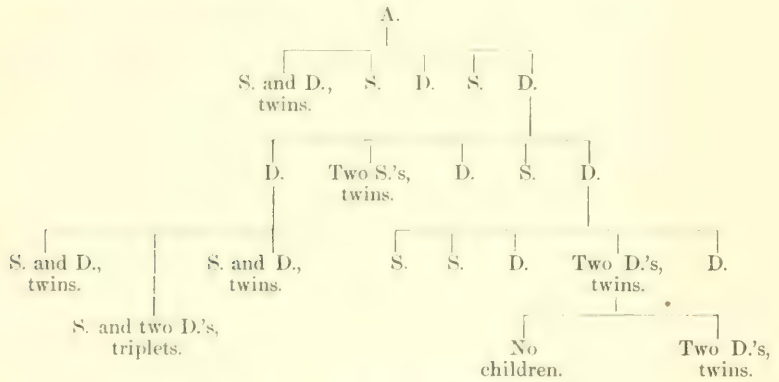
first traction in a horizontal direction (with possibly a slight downward inclination), until the large fontanel can be felt under the pubic arch; the handles of the instrument are then gradually raised to deliver the occiput, and when this is accomplished the birth of the face follows easily upon a depression of the forceps into the first position. Zweifel[1] in impacted cases with fetal death recommends decapitation by Braun's blunt hook.

Multiple Pregnancy.—Interesting cases of twin pregnancy are recorded as follows: DeLee,[2] a case in which the sac of the first child contained a gallon of water, and the child presented by the face (L. M. A.); a living child was extracted by forceps. The second child presented transversely, and was delivered alive by version. There were two placentas adherent by a wall of decidua. The children were both males; Kahn,[3] a case of twin pregnancy with two placentas, that of the first child being prævia. The patient stepped out of bed on the 11th day, developed a heart-clot, and died on the following day; Heiman,[4] a case with maceration of 1 fetus, the other surviving; Ulecia,[5] a case of twin confinement with mummification of 1 fetus. The mother, a 23-year old multipara, developed purpuric spots at the fifth month of pregnancy. These disappeared under treatment with iron, but later signs of antepartum septicemia occurred. The fever continuing despite treatment, labor occurred prematurely. After the birth of a living fetus there was placental retention with syncope. The placenta was extracted manually, and with it came a mummified fetus of 6 months. The placenta was single and gave insertion to the two umbilical cords. An intrauterine antiseptic injection was given, but signs of postpartum septicemia appeared. These, however, were overcome and the patient recovered. The living fetus died from tetanus some hours after birth; Goullioud,[6] a case of double pregnancy in a double uterus, abortion occurring at the third month [cases of double uterus and double pregnancy are not common; Pozzi has collected 3 cases from literature]; and Moseley,[7] a case in which 1 fetus was intrauterine and the other tubal. (See *Extrauterine Gestation.*) Pujol[8] reports the case of a patient, aged 24 years, who was admitted to the hospital in the pregnant condition. On examination it was found that the membranes had ruptured, and that the patient was probably pregnant with a very large child or with twins. Dilatation of the cervix proceeded until it was possible for the attending physician to make a thorough examination, when the knees of a small child were found presenting, and the fetus was readily extracted. The second child had the usual presentation, and was born without special difficulty. It was found that one child had perished some time previously, and that its head had been greatly pressed upon by the second, larger, and living child. The second twin had survived the death of the other without especial injury. A. W.

[1] Centralbl. f. Gynäk., No. 20, 1895.
[2] Chicago Med. Recorder, Oct., 1895.
[3] St. Petersburger med. Woch., No. 16, 1895.
[4] Med. Rec., Aug. 24, 1895.
[5] Arch. de Ginec., Obstet., y Pediat., Barcelona, June 10, 1895.
[6] Lyon méd., No. 25, 1895.
[7] Am. Jour. Obst., May, 1896.
[8] Arch. de Gynéc. et de Tocol., 1896, No. 3.

White[1] of Trinidad reports an interesting case of *superfetation* as having occurred on May 9, 1895: A female fetus 6 inches long was first delivered; from its size and appearance it was supposed to be about 4 months old. It was dark-colored like its mother. Soon after the removal of the placenta a full-formed, full-term female infant, which had all the appearance of a "white man's child," was born.

The influence of inheritance on the tendency to have twins is illustrated by papers by Bremner,[2] Von Speyer,[3] Macphail,[4] Cory,[5] and Wakley, Jr.[6] Bremner gives the following family history, which is vouched for by more than one of the relatives. He attended the mother of the last pair of twins, herself one of twins. There is no history of twin births in any of the husbands' families, as far as could be discovered:



S. = son; D. = daughter.

Cory, in a study of 17 cases of twins, finds that there was a history of twins among ancestors in 76% of the cases. Von Speyer states that the rarer forms of multiple pregnancy are undoubtedly hereditary. Stoker[7] records a case of quintuplets, and Vassali[8] an undoubted case of sextuplets. Stoker's patient was a healthy woman, 35 years old, 5 feet 1 in. high, and of slight build, whom he delivered of 5 fetuses in the seventh month of pregnancy, none of the children surviving. The patient's mother had on two occasions given birth to twins. The woman herself had been married for 6 years and had borne 4 children at full term, having no difficulty in labor. When she came under observation she computed that she had been pregnant for 6 months, and had had her attention attracted to the unusually large size of her abdomen. She complained of fixed pain in the left side of the abdomen, on which side she thought she was larger. Pains set in with regularity and the labor lasted $8\frac{3}{4}$ hours. After the rupture of the membranes the first child presented by the shoulder.

[1] Brit. Med. Jour., July 6, 1895.
[2] Lancet, Feb. 8, 1896.
[3] Mittheil. aus klin. u. med. Instituten der Schweiz, 1st Series, part 11, 1895.
[4] Lancet, Dec. 7, 1895.
[5] Ibid., Nov. 2, 1895.
[6] Ibid., Nov. 23, 1895.
[7] Ibid., Nov. 9, 1895.
[8] Brit. Gyn. Jour., Aug., 1895.

Version was readily performed; the child was dead (recently). Examination after the birth of the first child disclosed the existence of more than one remaining fetus. The membranes protruded and became tense with each contraction. The presentation was a transverse one. In this case also there was little difficulty in effecting internal version. The child lived a couple of hours. The third fetus was also enclosed in a separate sac, which had to be ruptured. The child presented by the breech and was delivered naturally, and lived for an hour. In the fourth case, too, the membranes had to be ruptured, and alarming hemorrhage ensued. Version was at once practised, but the chin became locked with that of the remaining fetus. There was some difficulty and considerable delay in freeing the children, though the extent of the locking was not at any time formidable. The child was dead (recently). The fifth fetus presented by the head and was delivered naturally. It lived for half an hour. The placenta was delivered about 5 minutes after the birth of the last child, and consisted of two portions united by a narrow isthmus. One, the smaller, had two cords attached centrally and close together; the other, and larger, had two cords attached in a similar way and one where it was joined to the isthmus. The organ appeared to be perfectly healthy. The cord of the fourth child was so short that it had to be ligated in the vagina. The children were all females, and much about the same size, making a total weight of 8 lbs. The mother rallied quickly and made a good recovery. Vassali's patient, who was 36 years old, grew anemic and weak in the early months of her pregnancy, and complained of chilly feelings. She did not feel motion. In the fourth month the abdomen was as large as that of a normal pregnancy at term, and the woman daily expected confinement. On the one hundred and fifteenth day of gestation the membranes ruptured while straining at stool, and a foot prolapsed. Before this she had experienced no pain. A fetus was delivered. The next morning pains began, with chills, flowing, rise of temperature, and vomiting, and it was decided to terminate her pregnancy. The membranes were ruptured, a foot brought down, and a second fetus was delivered. A third bag of membranes presented, and a third fetus was delivered, and so on till the fifth. The process lasted 2 hours, when an endeavor was made to hasten what was thought to be the third stage of labor, but the attempt to remove the placenta revealed a sixth amniotic sac and fetus. All the fetuses were born alive and moved vigorously. The sexual organs were differentiated, 4 being males and 2 females. The large single placenta bearing the six amniotic sacs was unfortunately so lacerated that further investigation was useless. The specimen is preserved in the museum of the Obstetrical School at Milan.

Excessive Size of the Fetus.—Bennett[1] records a stillborn male fetus weighing 14 lb.; Woodward,[2] a living female fetus weighing 11 lb. 10 oz.; and Brothers,[3] a stillborn fetus weighing 14.3 lb., the mother also perishing 48 hours after labor. Goenner[4] has made an extensive series of observations upon the heads of children to determine the factors that produce the predom-

[1] Lancet, Jan. 11, 1896.
[2] Ibid., Dec. 14, 1895.
[3] Am. Jour. Obst., Apr., 1896.
[4] Zeit. f. Geburtsh. u. Gynäk., Bd. 33, H. 1, 1895.

inant features in the child's cranium, and to ascertain methods by which the size of the cranium may be inferred before labor. He concludes that in the majority of cases the cranium of the child resembles that of the parents. This undergoes change during the process of birth, but the resemblance develops continuously when the child recovers from birth-pressure. The heads of newborn children are much narrower at birth than later. As regards the resemblance that the child's head bears to one or other parent, it is impossible to say that either parent determines the shape of the child's head. Hereditary peculiarities may be present, dating back to grandparents. At present we possess no accurate means of foretelling peculiarities in contour in the fetal head. Palpation and internal examination remain our only methods of obtaining knowledge. Phanomenoff[1] draws attention to the difficulty of delivering large children by reason of impaction of the shoulders. When he has failed to deliver by rotating the shoulders into an oblique diameter of the pelvis, he has had good success by performing double cleidotomy, cutting both clavicles with blunt-pointed scissors; the left hand is introduced as a guide, and each clavicle severed at its inner end. The scissors must be curved at an angle in order to accommodate themselves to the pelvic canal.

Shoulder-presentation.—Cases of spontaneous evolution during labor are recorded by Grasemann[2] in a slender primipara, the child having recently died, and being at term and of average length; and by Gomberg.[3] In neglected shoulder-presentations Kehrer[4] states that the *vis a tergo* acting upon the head and breech of the fetus produces a kyphoscoliosis; the thorax and abdomen form a cone, which, crowded through a dilated cervix uteri, is impacted in the true pelvis. The treatment, if the infant be alive, consists in forcing the flexed portion back toward the fundus uteri to straighten it, then to push it toward the side where the head lies, in order to perform podalic version; if the child be dead, embryotomy is necessary. [The danger of uterine rupture must be remembered in performing this maneuver.]

The Causation of Face-presentation.—In an exhaustive monograph Muggia[5] discusses the various alleged etiologic factors in face-cases, and gives in a tabular form the details of 41 such labors. The frequency with which these confinements occurred was once in 137 cases (41 in 5644 labors), and of the 41 instances met with, in 25 the chin of the child was to the back and right side, in 2 it was to the front and left, in 2 to the back and left, in 2 to the front and right, and in 5 it lay transversely and to the left. Among the fetal causes for the presentation found by Muggia were fetal struma, coiling of the cord round the neck, dolichocephaly, absence of the cranial vault, small size of the fetus, oblique position of the fetus, maceration, increase in the biparietal diameter, abnormal size of the head, abnormal shortness of the neck, and the female sex. The maternal causes included repeated pregnancy,

[1] Centralbl. f. Gynäk., No. 22, 1895.
[2] Ibid., No. 43, 1895.
[3] Univ. Med. Mag., Nov., 1895.
[4] Nouv. Arch. d'Obstét. et de Gynécol., No. 9, 1895.
[5] Ann. di Ostet., Sept. and Oct., 1895.

hydramnios, uterine obliquity, uterine tumors, low implantation of the placenta, and pelvic contraction. It would seem that the fetal causes are the more important, and heredity may even come into play. A practical conclusion is that, if a face-case evidently represents the expression of given anatomic conditions, maternal and fetal, the intervention of the obstetrician is in the great majority of cases unnecessary. The genupectoral position of the patient in labor is advisable in order to aid the rotation of the chin. All external and internal manual interference should be undertaken only in definitely ascertained cases and under certain circumstances, for the fetus which presents by the face will often come safer thus into the world than if its presentation is modified. In only 1 of the author's cases was an asphyxiated infant not resuscitated. Of course it would be absurd to say that a face-case is more favorable than a vertex: at the same time, under the circumstances, presentation by the face may be a natural way of escape.

Retention of Urine in a Fetus.—Devé[1] states that he found nearly 7 pints of urine in the distended bladder of an 8 months' fetus; nearly 1 in. of the urethra was reduced to an impervious fibrous cord, and the rectum ended in the bladder. The urine contained only 0.024 milligrams of urea to the liter. Porak[2] relates the case of double hydronephrosis due to an incomplete valvular stricture of the membranous part of the urethra, and in a similar case to Devé's the urine was as deficient in urea. [This would seem to prove that the fetal kidneys probably eliminate nothing but water, with sodium chlorid in the proportion which that salt holds in the blood, and that the true renal functions in intrauterine life are discharged by the placenta.]

Funic Prolapse.—Brothers[3] has tested the Trendelenburg posture in the treatment of prolapse of the cord in 3 cases, and has succeeded in saving all the children. He claims that the cord can be replaced with much greater ease by this method than by placing the woman in the knee-chest posture.

Enormous Distention of the Fetal Abdomen.—Neumann[4] applied the forceps in a primipara on account of the arrest of the progress of labor. The birth of the head was easy, but the rest of the body did not follow, in spite of vigorous traction upon the head, which finally tore off. Neumann then passed his hand into the uterus and found the abdomen enormously distended with fluid, which made its entrance into the pelvis impossible. After its puncture the body was easily delivered. A postmortem examination showed a rudimentary formation of the external genitals and the absence of urethra and anus.

OBSTETRIC OPERATIONS.

Forceps.—Wahl[5] gives the statistics of forceps operations done in the Königl. Frauenklinic of Dresden during the 5 years from 1889 to 1894, as follows: The forceps were applied 232 times in 9061 deliveries, or in about

[1] Ann. de Gynéc. et d'Obst., June, 1895. [2] Jour. de Méd. de Paris, June 23, 1895.
[3] Am. Jour. Obstet., No. 6, 1895. [4] Monatsch. f. Geb. u. Gyn., Bd. iii. H. 3, 1896.
[5] Arch. f. Gyn., vol. 50. No. 2.

2.56% of the cases. In 29.3% of the cases the operation was done in the interest of the mother; in 65.9% in the interest of the child; and in 5.5% for both mother and child. 81% of the mothers were more or less injured by the operation, and 18.9% developed a high fever. The total mortality was 5.17% for the mothers and 21.2% for the children, but in no case was the death of the mother directly due to the operation, and only 5.6% of the children died from that cause. [These statistics do not differ essentially from those of other clinics]. Shick[1] gives the results of the use of forceps in 2920 labors. Birth was completed by forceps in 3.63% of cases, most of these being primiparæ. In 60% of the cases the mother was lacerated. The maternal mortality was 4.7%, while 11.32% of children perished. Of the mothers, 1.8% had septic infection. Shick concludes that the forceps is the bloodiest method of delivery, and that its mortality-rate renders it a serious procedure for mother and child. The advantages of Walcher's position in forceps operations and in all cases in which there are minor grades of pelvic contraction are emphasized by Fothergill,[2] Currier[3] and Johnston.[4] By its employment a spontaneous delivery may follow when otherwise forceps would be required. Fothergill states that by allowing the legs to hang the weight of the limbs will be transmitted to the innominate bones, causing a rotation of the pelvic girdle about an axis passing through the two sacroiliac joints, and when the symphysis moves downward in their rotation the conjugate is increased. The increase in the diagonal conjugate may reach 1.2 cm., the average increase being 0.93 cm. In other positions the chief power in forcing the symphysis down is the contraction of the uterine and abdominal muscles. Much of this force or energy is saved by the weight of the limbs, and the pressure of the head on the symphysis is avoided. When the legs are allowed to hang the perineum is not put on the stretch, and hence the danger of laceration is generally diminished. The position saves the perineum from undue pressure by forceps, especially when high forceps are used. Currier gives as indications for the use of Walcher's position: 1. Cases of protracted labor in which the dimensions of the pelvis are normal or the anteroposterior diameter is somewhat shortened, the head being above the brim; 2. Cases in which version, either cephalic or podalic, has been performed, or footling or breech cases. The flat pelvis, the generally contracted pelvis, transverse positions, and occipitoposterior positions are in this category; 3. Cases in which some form of operative procedure has already been adopted without success.

Symphysiotomy.—Cases are reported as follows: Dawbarn,[5] 1 fatal case, the patient dying of shock 7 hours after the operation; Cameron,[6] 1 successful case; Jewett,[7] 1 successful case; Treymann,[8] 3 successful cases;

[1] Monatsh. f. Geburtsh. u. Gynäk., Bd. i. H 6, 1895.
[2] Edinb. Med. Jour., July, 1895.
[3] Med. News, Mar. 7, 1896.
[4] Am. Gyn. and Obst. Jour., Aug., 1895.
[5] Am. Jour. Obst., Mar., 1896.
[6] Montreal Med. Jour., vol. xxiv. No. 6, 1895.
[7] Am. Gynæc. and Obst. Jour., Nov., 1895.
[8] St. Petersburg. med. Woch., No. 43, 1895.

Hirst,[1] 2 successful cases, 1 for concealed hydrocephalus, and the other for general pelvic contraction; T. E. Taylor,[2] 1 successful case in a woman whose 4 previous labors had been terminated by craniotomy; Ayers,[3] 4 successful cases, 1 being a twin birth, both fetuses surviving (the only twins delivered by symphysiotomy that have lived); Pomeroy,[4] 1 successful case; Auvard,[5] 3 successful cases; Abilio di Marcarenhas,[6] 1 successful case; Lowoff,[7] a fatal case in a tertipara aged 29 years, with a rachitic pelvis, the external conjugate being 16 cm. and the true conjugate $6\frac{1}{2}$ cm.; in her first pregnancy she had been delivered spontaneously of a dead child, and in the second pregnancy a living child was secured after a difficult labor; the patient died of dysenteria septica on the thirteenth day after operation; Walter,[8] a successful case in a secundipara aged 29 years, with a justominor pelvis, the true conjugate measuring 7 cm. Her first labor had resulted in a craniotomy; in the present labor the child lay transversely, one hand prolapsed, the cord pulsating; on account of the pelvic contraction it was impossible to introduce the hand into the uterus and perform a version; symphysiotomy was therefore decided upon, whereupon version became easy, but the after-coming head could only be extracted after prolonged manipulation, notwithstanding the fact that the fetus was premature (34th week); the child perished, but the patient recovered after 40 days, retaining, however, a vesicovaginal fistula which was subsequently closed; Lauw,[9] a successful case in a secundipara with a true conjugate of $8\frac{7}{10}$ cm.; the first labor had resulted in a craniotomy; in the present pregnancy the child lay transversely; a living child was extracted after symphysiotomy, and the mother made a good recovery; Gorochow and Chlebnikow,[10] a successful case in a quartipara aged 24 years, the diagonal conjugate measuring 8 cm.; in the first 2 confinements dead children were extracted after prolonged labors; the child in the third labor lay transversely; version was performed and the after-coming head perforated; in the present instance the head presented and the hand prolapsed; forceps were applied after symphysiotomy and a living child extracted; the mother made a good recovery; F. H. Sweeny,[11] 2 successful cases; A. B. Tucker,[12] 2 successful cases; and E. E. Ellis,[13] 1 successful case. Edgar[14] reports a bad result from the operation; the woman had become septic, and there had resulted necrosis of both surfaces of the horizontal rami of the pubes, the gap finally filling with fibrous tissue. Auvard's method of proceeding is different from that of other operators, in that he first applies forceps, and, failing to deliver, performs symphysiotomy without removing the forceps. [The advantage of this method is not evident.] Pinard[15] publishes some further records of high value on symphysiotomy.

[1] Am. Jour. Obst., July, 1895.
[2] Med. Rec., Sept. 21, 1895.
[3] Am. Med.-Surg. Bull., Feb. 22, 1896.
[4] Am. Gyn. and Obst. Jour., Apr., 1896.
[5] Arch. de Tocol. et de Gynéc., No. 12, 1895.
[6] Ann. de Gynéc., vol. xliii. 1895.
[7] Rep. of Gov. Hosp. in Kazan.
[8] Vereinblatt der Pfälzischen Aerzte, 1894, H. 5.
[9] Centralbl. f. Gyn. No. 9, 1896.
[10] Wratsch, No. 32, 1895.
[11] Indian Med. Gaz., Feb., 1896.
[12] Am. Gynæc. and Obst. Jour., Mar., 1896.
[13] Memph. Med. Month., Mar., 1896.
[14] Am. Gynæc. and Obst. Jour., Mar., 1896.
[15] Ann. de Gynéc. et d'Obstét., Jan., 1896.

In 4 years 69 cases of pelvic contraction have been treated by this method of temporary enlargement of the pelvic diameters at the Baudelocque Clinic; 62 mothers and 61 children were saved, 7 mothers and 8 children being lost. Geuer [1] records a case of symphysiotomy in a primigravida with failure of the bones to close. This was remedied by an osteoplastic operation after recovery from the labor. In order to keep the pubic bones in apposition after symphysiotomy Tarnier [2] uses a belt of India rubber covered with linen. The belt is placed under the loins of the patient, and is suspended by cords that cross above the bed and pass through pulleys attached to the frame of the bed. By attaching weights to the cords the pressure on the iliac bones may be increased or diminished at will. This apparatus permits the patient being moved about in the bed.

Queirel [3] of Marseilles has examined 200 women to determine the question as to whether the pubic joint is in the median line of the pelvis or whether it is often to one side. This investigation was undertaken because, in performing symphysiotomy, operators have failed to find the joint, and have in some instances cut through bony tissue, asserting that the joint was ossified. Of these 200 women, 135 had borne children, 65 had not. Their ages ranged from 20 to 89 years. He found between the ages of 31 and 40 in 39 women examined that the joint was 4 times upon the left of the median line and in 5 patients upon the right. In 50 women whose ages varied between 21 and 30, in 7 there was a deviation to the left, in 6 to the right. At other ages deviation was found in less frequency. In all, in the 200, in 20% the joint was not in the median line. An examination of the records of large numbers of symphysiotomies shows that the pubic joint is very rarely ossified.

Cesarean Section.—Cases are recorded as follows: Elder,[4] a Porro operation for labor complicated by uterine fibroids in a primipara of 35 years; the patient recovered; G. Haven,[5] 1 successful case; H. C. Coe,[6] 1 successful case; Abel,[7] a successful Porro operation after ventrofixation; Schwartz,[8] a successful Porro operation in a rachitic pelvis; Tschudy,[9] a Porro operation in a case of uterus didelphys in a primiparous woman of 30 years; the unimpregnated uterus was left in situ; Slocum,[10] a Sänger operation in a young colored girl of 16½ years with extreme pelvic contraction; Wysor,[11] 3 cases, 2 for pelvic contraction and 1 for uterine fibroids; 2 of the women died; Mayo,[12] a Porro operation for uterine fibroids, with recovery; Hunter,[13] a Porro operation for uterine fibroid; Wordin,[14] a Porro operation for uterine fibroid in a primipara of 39 years; Row,[15] a Sänger operation in a multipara whose entire genital tract was the seat of very deep and extensive tertiary syphilitic

[1] Centralbl. f. Gynäk., No. 43, 1895.
[2] La Sem. méd., No. 41, 1895.
[3] Ann. de Gynéc., 1895, vol. xliv.
[4] Med. Press and Circ., Dec. 4, 1895.
[5] Bost. M. and S. Jour., Apr. 30, 1896.
[6] Am. Gyn. and Obst. Jour., May, 1896.
[7] Münch. med. Woch., No. 10, 1896.
[8] Centralbl. f. Gynäk., No. 15, 1896.
[9] Arch. f. Gynäk., vol. xlix. No. 3.
[10] Am. Jour. Obstet., Feb., 1896.
[11] Ibid., Apr., 1896.
[12] Ibid., Jan., 1896.
[13] West. Reserve Med. Jour., 1895, No. 8.
[14] Yale Med. Jour., Apr., 1896.
[15] Lancet, Jan. 25, 1896.

ulcerations; the woman died of exhaustion 2 days later; Hirst,[1] a Porro operation in a primipara with contraction of the pelvis; Haskin,[2] a Porro operation in a woman upon whom, 2 years previous, a Sänger operation had been performed; both mother and child survived; Coakley,[3] 2 Sänger operations on the same woman 2 years apart for pelvic contraction; Ludwig,[4] a Cesarean section for labor in a kyphotic pelvis with an exostosis over the symphysis in a patient 28 years of age; Paton,[5] a fatal Sänger operation in a primipara with pelvic contraction; and Sänger,[6] a remarkable case of conception through an accessory ostium tubæ, with absolute obstruction to the delivery of the child by a former ectopic gestation filling the entire pelvic cavity, and necessitating a Cesarean section.

The technic of the improved Cesarean section as employed by Garrigues[7] is as follows: An incision is made in the median line half above and half below the umbilicus, as in other abdominal sections, just long enough to turn out the uterus, and, on account of the elasticity of the abdominal wall, that means that the opening is much smaller than the uterus, about 6 or 7 inches. The right hand is now introduced into the abdominal cavity and used to turn out the uterus, seizing it in the region of the left corner. Next the upper part of the incision is closed with 3 or 4 silk sutures, an inch apart and going through the entire wall; this keeps the intestines and omentum away from the field of operation. A rubber tube is laid loosely around the cervix and the broad ligaments outside of the appendages, and crossed, but not tied, so that the assistant in charge of this constrictor can easily tighten it or loosen it according to circumstances. The uterus is enveloped in a sterilized cloth wrung out of hot sterilized water, and a dry pad is placed in front of and behind it, to which it is well, if the waters are unbroken, to add a piece of gutta-percha tissue. Next, the elastic constrictor is tightened, and the operator incises the womb, the incision being made in the median line of the organ, clamping bleeding sinuses. The left index finger is introduced, and the incision extended on it with scissors or a probe-pointed bistoury up to the upper end of the cavity and far enough down to insert the hand and pull out the child, but *carefully avoiding the lower uterine segment*, where there are large veins and much less contraction than in the body of the organ. This incision is from $4\frac{1}{2}$ to $5\frac{1}{2}$ in. long. If the placenta is inserted on the anterior wall, the incision is carried through it. If the waters have not broken, the operator tears the ovum near the lower end of the incision, taking care that none of the fluid enters the peritoneal cavity, especially if it be decomposed or contain meconium. If the waters have drained off before the operation, the operator takes particular care not to wound the child in making his incision. When the ovum is ruptured the operator introduces his right hand and, if possible, delivers the head of the child first, whereby the danger of the uterus contracting in front of it is

[1] Am. Jour. Obst., July, 1895.
[2] Am. Gynæc. and Obst. Jour., Feb., 1896.
[3] Jour. Am. Med. Assoc., Apr. 11, 1896.
[4] Centralbl. f. Gynäk., No. 20, 1895.
[5] Pacific Med. Jour., Dec., 1895.
[6] Monatsh. f. Geburtsh. u. Gynäk., 1895, vol. i. No. 1.
[7] Int. Jour. Surg., Mar., 1896.

avoided. If this is not easily done, he seizes an extremity or the body and extracts the child. The cord is tied immediately with a double ligature, and cut between the two ligatures, and the child is handed to a competent nurse or preferably a physician, who, if necessary, uses the usual means of reviving it. If the placenta is cast loose, the operator seizes it and peels off the membranes from the interior of the womb, so as to have all the after-birth in one piece. If, on the other hand, the placenta yet adheres to the wall, he leaves the after-birth alone and inserts the deep uterine sutures, by which time the placenta will probably have separated, but if it has not, he peels it off like the membranes, which always are adherent, before tightening the sutures. If the operation is performed before the cervix is dilated, this should be done manually, so as to ensure free drainage from the uterus to the vagina. For the sutures sterilized silk is the best material, a medium thick—No. 4 of the braided—for the deep, and a fine—braided No. 2—for the superficial. The deep are inserted $\frac{1}{2}$ in. from the edge through the peritoneal and muscular layer, but do not touch the endometrium. There should be one for each inch of the length of the incision. In tightening them the serous surfaces are merely brought together, and not drawn down between the edges, thus ensuring better coaptation of the muscular surfaces. When these deep sutures have been tied, superficial ones, only comprising the peritoneum, are inserted midway between two and two of the deep. They are likewise inserted $\frac{1}{2}$ in. from the edge, but are pushed out again $\frac{1}{4}$ in. from the latter, and inserted in a similar way on the opposite side, so as to apply broad surfaces against each other. After the removal of the after-birth the interior of the womb is simply wiped dry and clots are removed. No antiseptics are needed, nor should the uterus be curetted. All sutures being placed and tied, the elastic constrictor should be loosened very slowly, since a sudden rush of blood into the uterus is apt to cause hemorrhage. The uterus should not be replaced in the abdominal cavity before all bleeding has stopped. If there is any bleeding, it is checked by compression, or by pouring hot water over the outside of the uterus, or by adding supplementary sutures, or, if necessary, by administering an intrauterine injection of hot sterilized water. When all bleeding has ceased, the constrictor is entirely removed, the womb replaced, and the abdomen closed as after other abdominal sections.

PATHOLOGY OF THE PUERPERIUM.

Puerperal Sepsis.—[Apart from the serum-treatment of puerperal sepsis, intravenous injection of mercuric chlorid, and the advances that have been made in vaginal bacteriology, there is but little new in this department of obstetrics.] A new classification of puerperal sepsis, founded on a combined clinical and pathologic basis, and including not only the more familiar but the rarer forms as well, is offered by Dorland.[1] Clinically, heterogenetic puerperal sepsis is encountered in two main varieties—namely, that in which there has occurred a general systemic infection, and that in which the general

[1] Phila. Polyclinic, Apr. 11, 1896.

infection is subordinate to the local manifestations. Under these main divisions the various forms of sepsis are grouped according to their pathologic features:

A. Heterogenetic Puerperal Sepsis.

Class I. General Puerperal Sepsis.

1. Hemic or vascular infection.
   - (1) Puerperal septicemia. Synonyms: Sapremia (Duncan); resorptive fever; ptomainemia; ptomain-poisoning; ptomain-intoxication; septic intoxication; septic fever; putrid infection; putrid intoxication.
   - (2) Puerperal phlebitis (infectious phlebitis; septicæmia venosa) with thrombosis (thrombophlebitis) and embolism (puerperal embolism).
     - (*a*) Uterine and parauterine phlebitis (phlebitis uterina; puerperal metrophlebitis).
     - (*b*) Puerperal pyemia (septicopyemia; pyæmia metastatica; pyæmia multiplex).
     - (*c*) Puerperal (septic) pneumonia.
     - (*d*) Puerperal (septic) ulcerative endocarditis.
     - (*e*) Puerperal rheumatism.—Puerperal (septic) arthritis.
     - (*f*) Femoral (crural) phlebitis (phlegmasia alba dolens).
   - (3) Puerperal (infectious) erythema (scarlatiniform erythema).
   - (4) Puerperal (septic) infectious pemphigus.
   - (5) Puerperal tetanus (tetanus puerperarum).
   - (6) Puerperal neuritis.

Class II. Local Puerperal Sepsis.

1. Lymphatic infection (septicæmia lymphatica; puerperal lymphangitis).
   - (1) Puerperal metritis.
     - (*a*) Phlegmonous (metritis purulenta).
     - (*b*) Gangrenous (metritis gangrænosa).
   - (2) Puerperal pelvic cellulitis (puerperal parametritis, puerperal perimetritis, puerperal ovaritis).
   - (3) Puerperal peritonitis, pelvic or general (peritonitis puerperalis).
2. Involvement of the genital mucosæ.
   - (1) Vulvitis.
     - (*a*) Catarrhal or suppurative (vulvitis catarrhalis).
     - (*b*) Phlegmonous or ulcerative (vulvitis purulenta).
     - (*c*) Gangrenous (vulvitis gangrænosa).
     - (*d*) Diphtheric (vulvitis diphtheritica).
   - (2) Endokolpitis.
     - (*a*) Catarrhal or suppurative (endocolpitis catarrhalis).
     - (*b*) Phlegmonous or ulcerative (endocolpitis purulenta).
     - (*c*) Gangrenous (endocolpitis gangrænosa).
     - (*d*) Diphtheric (endocolpitis diphtheritica).
   - (3) Endometritis.
     - (*a*) Catarrhal or suppurative (endometritis catarrhalis).
     - (*b*) Phlegmonous or ulcerative (endometritis purulenta).
     - (*c*) Gangrenous (endometritis gangrænosa).
     - (*d*) Diphtheric (endometritis diphtheritica).
   - (4) Endosalpingitis.
     - (*a*) Phlegmonous or ulcerative (endosalpingitis purulenta; puerperal or septic pyosalpingitis).
3. Puerperal (septic) urethritis, cystitis, ureteritis, and pyelitis.
4. Puerperal (septic) proctitis.

B. Autogenetic Puerperal Sepsis (Autoinfection).

Döderlein[1] believes that the time has now come to abandon the old classification (catarrhal, purulent, diphtheric, and gangrenous), and to distinguish two forms of puerperal endometritis: Putrid endometritis, due to saprophytes, and septic endometritis, due to streptococci. Romme[2] states that the virulence of the vaginal streptococcus in a healthy pregnant subject not officiously treated by the obstetrician and midwife is equal to that of the streptococcus of other mucosæ; in other words, it is not virulent at all, and acts as a saprophyte on healthy tissues. But when the resistance of the tissues is diminished in the vagina, as in the intestine, the streptococcus can act as a parasite, and be as virulent as the special germ of the same genus that causes puerperal sepsis. Hence routine injections are deleterious in normal labor in which delivery has not involved true traumatism of the tissues, and digital exploration is to be avoided as far as possible, as vaginal streptococci might be introduced into the previously aseptic but naturally lacerated tissues of the uterus. On the contrary, vigorous disinfection of the vagina is indicated whenever exploration or operative intervention has to be carried above the level of the os externum and in all abnormal labors; it is also needed when the patient has an affection that diminishes the resistance of the tissues, as nephritis, cardiac disease without compensatory hypertrophy, syphilis, diabetes, intercurrent infectious maladies, and anemia. Fehling[3] states that absorption fever is not rare in patients suffering from gonorrhea during pregnancy, and pustubes are often noted. Bumm[4] has demonstrated that the fibrinous membrane forming upon the mucous surface of the genital tract during the so-called diphtheric cases of puerperal sepsis does not always contain the diphtheria bacilli, but streptococci in abundance. He reports a case, however, in which the diphtheria bacilli were present and the streptococci absent, probably due to the action of antitoxin which had been given in three injections. Solowieff[5] concludes that though intermittent fever is relatively rare during pregnancy and the puerpery, it may be the cause of abortion, premature delivery, or in some cases of the death of the fetus, and may be mistaken for puerperal sepsis. In all such cases treatment with quinin, opium, and arsenic is effective. Pearson[6] records a case of puerperal hyperpyrexia, the temperature on the evening of the fifth day reaching 107.4° F. after a sharp rigor; on the evening of the seventh day it was 106°. Acetanilid in full doses reduced the fever and the patient recovered. Bar[7] describes a rare case of gonorrheal rheumatism in the puerperal state, the patient ultimately making a good recovery. Balls Headley[8] records a case of puerperal pelvic cellulitis from phlebitis, followed by complete recovery without operation.

Delayed Puerperal Infection.—Doléris[9] points to the established fact that the bacilli of infection may be temporarily innocuous until some incident

[1] Am. Med.-Surg. Bull., Sept. 1, 1895. [2] Arch. de Tocol. et de Gynéc., Feb., 1896.
[3] Münch. med. Woch., Dec. 3, 1895. [4] Zeit. f. Geburtsh. u. Gynäk., 1895, Bd. xxxiii. H. 1.
[5] Rev. méd. Chir. des Mal. des Femmes, June, 1894. [6] Lancet, Jan. 25, 1896.
[7] La Presse méd., No. 60, 1895. [8] Ann. Gynæc. and Pæd., July, 1895.
[9] Nouv. Arch. d'Obstét. et de Gyn., Nov., 1895.

again arouses their former virulence; thus it comes that an infection that has been latent for weeks or months suddenly flares up with surprising intensity. He refers to cases of mild puerperal infection that during the puerperium gave either very slight or no symptoms at all. Weeks later, owing to some influence unknown, the latent bacteria are again aroused to activity and produce serious symptoms of puerperal infection. Infection may also occur some time after labor or the puerperium, which may still have a puerperal character, because the sexual organs have not regained their former conditions, and still possess a special morbid receptivity. The treatment of delayed puerperal infection is in accord with antiseptic principles.

A rare form of puerperal sepsis (*endometritis diphtheritica dermatomyositis*) is recorded by Heinricius.[1] A pluripara was seized 3 days after a normal confinement with chills and high fever; during the next few days there was a stinking lochial discharge, but no symptoms of peritonitis; on both legs and forearms painful swellings occurred, the overlying skin being spotted and very sensitive. On the forearms were larger and smaller blebs containing clear serum. The patient presented the picture of marked sepsis, and succumbed on the tenth day. An incomplete postmortem examination showed the absence of peritonitis or parametritis. The endometrium was covered by greenish-yellow shreds. The corium, intramuscular connective tissue, and the muscles underlying the swellings of the extremities were soft and edematous, but pus was absent. Out of these tissues and the endometrium pure cultures of streptococci were obtained.

Puerperal Tetanus.—Cases of puerperal tetanus are reported by King,[2] Thomas,[3] Withington,[4] Walko,[5] and Rubeska.[6] Withington's case developed after an abortion, the patient suffering from repeated attacks of spasm, with opisthotonos; gradual improvement followed 3 injections of tetanus-antitoxin (22 ccm. each), in all 68 ccm. In Walko's case the antitoxin treatment was unsuccessful, the patient receiving in all 18 injections, comprising $3\frac{6}{10}$ grams. Well-marked leukocytosis developed after the second injection. Bacteriologic examination was negative. Extirpation of the uterus was practised in Rubeska's case without success, the patient dying on the fifth day. A fatal case of tetanus following delivery, which was accompanied by a slight laceration of the perineum, is reported by W. F. Sawhill,[7] and Drappier[8] records a fatal case in a secundipara due to the use of an intrauterine douche.

Phlegmasia Alba Dolens.—Mowat[9] records a case of phlegmasia alba dolens in a virgin of 18 years, while Herman[10] records a similar case, in which, however, both legs were involved consecutively. Roberts[11] read a paper before the Obstetrical Society of London in which he gave details of 16 cases of

[1] Monats. f. Geb. u. Gyn., Bd. ii. H. 1, 1896.
[2] Am. Jour. Obst., Aug., 1895.
[3] New Orl. M. and S. Jour., June, 1895.
[4] Boston M. and S. Jour., No. 3, 1896.
[5] Deutsch. med. Woch., Sept. 5, 1895.
[6] Wien. klin. Rundsch., 1895, p. 375.
[7] Kansas City Med. Index, Feb., 1896.
[8] Jour. des Sci. méd. de Lille, No. 52, 1895.
[9] Lancet, Nov. 9, 1895.
[10] Ibid., Oct. 5, 1895.
[11] Brit. Med. Jour., May 11, 1895.

so-called "white leg." He proposes the following classification: 1. Cases due to pressure; 2. Cases associated with general disease; 3. Cases of a true septic nature; 4. Cases of thrombosis apart from sepsis; 5. Cases of thrombosis and sepsis combined. He concludes that the common variety after delivery is the thrombotic, the thrombosis in most cases starting primarily in the uterine and pelvic veins; the brawny white leg is rare. The onset of the disease is about the tenth or twentieth day, and the cases run a definite course of about 6 or 8 weeks. The prognosis to life is good, but the prognosis to the leg itself is not good. Raymond[1] records a case developing on the ninth day and lasting for over 4 months.

Treatment of Puerperal Sepsis.—[The serum-treatment of puerperal sepsis has attracted considerable attention during the year, but sufficient statistics have not accumulated as yet to warrant the assumption of positive conclusions.] According to Imlach,[2] the researches of Bokenham in the experimental laboratory of the College of Physicians have apparently resulted in the discovery of a microbicidal serum that may be safely employed in early cases of septicemia with a reasonable hope of success. It is only at the very inception of septic fever, however, that we are to depend upon the action of the antistreptococcic serum. Gaulard[3] describes 2 cases of puerperal sepsis which he treated by injections of Marmorek's antistreptococcic serum—that obtained from animals immunized by injections of increasingly virulent *complete* cultures—with good results in 1, but death in the second case. The serum does not do away with the necessity of using the curet, but if the germs have already entered the blood, it may be employed against them and their toxins. Jacquot,[4] Vinay,[5] Macfarlane,[6] and Kennedy[7] report cases successfully treated by the serum. Vinay states that while the serum may be all-powerful against recent infection of the blood, it is inefficacious against once-established organic lesions. It is in instances of the former that the serum is indicated, and it should be administered at the time when the blood is invaded by the toxins of the streptococci and by the streptococci themselves. This treatment must not be employed alone, especially at the beginning, and should not exclude local treatment of the infected mucosæ. Furthermore, antistreptococcic serum is not efficacious in those forms of puerperal septicemia due to other bacteria than the streptococcus. The ideal method of studying these cases would be to make cultures from the cervix in each case, using the serum only in such cases as are thus shown to depend upon the streptococcus. In general, the most serious infections are due to the streptococcus, and if we have chills and a rise of temperature to 40° C., we may assume, almost with certainty, the presence of the streptococcus. It seems best to use the injections in the evening, when their effect will increase the spontaneous fall of temperature.

De Kesmarky[8] used intravenous injections of mercuric chlorid, $\frac{1}{6}$ gr. a

[1] Brooklyn Med. Jour., Feb., 1896.
[2] Prov. Med. Jour., Oct. 1, 1895.
[3] La Presse méd., Nov. 30, 1895.
[4] Ibid., May 18, 1895.
[5] Lyon méd., Jan. 26, 1896.
[6] Jour. Am. Med. Assoc., May 16, 1896.
[7] Lancet, Nov. 2, 1895.
[8] Rev. méd.-chir. des Mal. des Femmes, May 25, 1895.

day for 20 days, in the treatment of puerperal infection. The patient died in 45 days from gangrenous metastatic abscess of the lung. In 2 other cases of puerperal infection he began with intravenous injections of $\frac{1}{65}$ gr., pushing it to $\frac{1}{12}$ gr. daily. The first patient received altogether a little over $\frac{1}{2}$ gr. in 10 injections; the second a little less than $\frac{1}{2}$ gr. in 8 injections. The temperature fell progressively from the beginning of the treatment. Both patients recovered. De Kesmarky states that this treatment is without danger and promises well.

The most modern treatment of general septicemia is that of hypodermic injections of creasote, recommended by Frank[1] of Cologne, Germany. This method has been employed by Mehrtens of Düsseldorf in a case of puerperal sepsis with remarkable results, the temperature falling from 104° F. to normal after the injection of creasote. A rise on the next day to 104° was again brought down by the injection, and subsequent injections, 3 times a day, prevented its recurrence. Mehrtens used a solution of equal parts of creasote and camphorated oil, of which he injected 20 minims thrice daily. None but good effects were observed.

The local treatment of puerperal sepsis, according to Pinard,[2] comprises intrauterine intermittent irrigation, continued irrigation, and curettage. Intermittent irrigation, first employed by Recolin and Levret, and recommended by Gensoul, Roche, and Lemuel Weiss in 1858, has become current treatment, especially since Pasteur revealed the true nature of infection. For this purpose Pinard uses the glass sound of Fariner, which is very easy to introduce, and, when ordinary precautions are taken, cannot break. The antiseptic liquid he employs is a solution of mercuric biniodid (1 : 4000) at 103° F. Being a partisan of low pressure, he places the reservoir containing the liquid for injection only 10 in. above the level of the patient, as in this manner the liquid cannot penetrate into the veins or the uterine sinuses. The amount injected generally exceeded 3 quarts, or until the liquid returned was quite clear. Continued intrauterine injection is entirely of French origin, but to a German, Shücking of Halle, is due the honor of being the first to apply it to obstetrics. Since 1885, Pinard has employed it frequently in his service. The method of operating is about the same as in the first case, but the sound is made of metal, as the glass might break. The antiseptic liquids are: a solution of mercuric biniodid (1 : 4000); a solution of phenol (1 : 100); a saturated solution of boric acid: 15 quarts of the first solution are injected, and followed by the second, and as soon as the temperature of the patient has come down to the normal it is replaced in its turn by the third. Objections have been made against this method, not only as regards the difficulty of adopting it in private practice, but also as regards the fact of leaving a sound *à demeure* for days and nights, which might produce an accident by the movements of the patient. Pinard considers that such a danger could only be feared where the instrument was not properly fixed to the patient. At any rate he never witnessed the slightest accident in all the cases in which he had tried it. The operation of

[1] Physician and Surgeon, Mar., 1896.

[2] Med. Rec., Nov. 23, 1895.

curettage followed by Pinard differs but slightly from that usually practised, with the exception of the absence of anesthetics and the nonemployment of the speculum. [For the surgical treatment of puerperal sepsis the reader is referred to the section on Gynecology.]

Puerperal Bradycardia.—Neumann[1] publishes his observations of the pulses of 500 women during the puerperium. According to Blot and other observers, bradycardia in the normal puerperium is due to an increased arterial tension and blood-pressure, owing to the sudden diminution of the uterine circulation. Olshausen believed it due to the absorption of fat from the degenerate uterus. Löhlein referred it to a disturbed innervation from an altered constitution of the blood. Swiecicki traces the alleged disturbance to chemical irritation of the uterine nerves as a part of the process of involution, which irritation in turn influences the vagus. Fritsch attributes the bradycardia to the mental and physical rest involved in normal labor. Schröder argues that after the suppression of fetal circulation the maternal heart, having less to do, contracts more slowly. Vejas considers the phenomenon in question due to an increased vital capacity of the lungs. Neumann concludes that puerperal bradycardia depends on stimulation of the cardiac inhibitory fibers, and arises through irritation of the vagus center during labor.

Postpartum Hemorrhage.—E. P. Davis[2] records a fatal case of postpartum hemorrhage due to an altered condition of the blood, general lack of muscular tonicity, and an inherited tendency to bleed. Leahy[3] records 10 cases of hemorrhage due to tonic spasm of the body of the uterus, an exceedingly rare cause of this accident. According to Mayne,[4] postpartum hemorrhage has been treated successfully a number of times by saturating a piece of lint in turpentine and introducing it by the hand into the uterus. No injurious results follow the use of this remedy.

Hematoma of the Vulva.—Cases of this rare condition are recorded by Goldberg[5] and Klautsch.[6] Cases of pelvic hematocele after labor are noted by Bliss[7] and Stadfeld,[8] the latter being a case of suprafascial pelvic hematoma, which, according to the writer, occurs almost without exception in primiparæ. It is due most frequently to the bursting of a blood-vessel in the connective tissue surrounding the vagina, with which it may communicate secondarily through rupture of the vaginal wall.

Superinvolution of the Uterus.—A case is recorded by Tingley.[9]

Puerperal Osteomalacia.—Neumann[10] has written a paper of high scientific value upon the excretion of magnesium, calcium, phosphoric acid, and nitrogen in puerperal osteomalacia, and the changes that are produced by castration and other therapeutic measures. He calculated in 3 cases of osteomalacia the amount of CaO, MgO, P_2O_5, and N in food taken by the patients,

[1] Monatsh. f. Geburtsh. u. Gynäk., Oct., 1895.
[2] Phila. Polyclinic, Jan. 18, 1896.
[3] Lancet, Aug. 3, 1895.
[4] Toledo Med. and Surg. Rep., 1895, No. 8.
[5] Internat. Med. Mag., July, 1895.
[6] Münch. med. Woch., Jan. 28, 1896.
[7] Lancet, Dec. 7, 1895.
[8] Centralbl. f. Gynäk., No. 28, 1895.
[9] Med. Rec., Nov. 2, 1895.
[10] Arch. f. Gynäk., Bd. 51, H. 1.

and the amount present in the feces and urine. These investigations are divided into different groups—namely, before and after the establishment of therapeutic measures, and before and after castration or the removal *in toto* of the pregnant uterus. As a result of these investigations the following conclusions may be mentioned: 1. The excretion of calcium in the urine is greatest in the beginning of the disease, when the bones are yet rich in calcium salts; as the disease progresses the excretion diminishes. 2. The calcium excretion differs in the various stages and with the severity of the disease. 3. After the removal of the ovaries or of the uterus, the CaO, MgO, and P_2O_5 excretion becomes again normal in mild cases, while in severe cases neither operation exerts any influence upon the further progress of the disease. 4. The osteomalacia is not simply a bone-disease, but the disease-process extends upon and involves all tissue-changes. 5. The removal of the ovaries or of the uterus is only of benefit in mild cases and in the beginning of the disease. This operation should, therefore, be performed early, as soon as other therapeutics have shown their uselessness.

Puerperal Polyneuritis.—Vinay[1] states that polyneuritis occurs in the course of the puerperal state at two distinct periods—during pregnancy and after delivery. The latter form is the more frequent, and has become classic since the work of Möbius was published in 1887. Möbius believed that the neuritis after delivery was characterized by its localization in the ulnar and the median nerves, but observations do not lack showing that motor and sensory disturbances may affect all four extremities. The sole characteristic of these postpartum neurites is their identical pathology, all being the consequence of puerperal septicemia. Polyneuritis in pregnant women is much rarer. In the author's book on the treatment of the diseases of pregnancy (Paris, 1894) he has been able to cite but 3 well-authenticated cases of this affection. The case published by the author in the present paper was that of a woman 38 years old, who had given birth to 6 children and who had 2 miscarriages. During the first 3 or 4 months of her last pregnancy she had frequent hemorrhages. During the last 2 months she vomited a number of times and felt pains in the calves of the legs and formication in the hands and feet. The delivery was normal. On the fourth day after delivery the patient got up, but could not stand; she fell to the floor. At the same time she discovered marked weakness of the arms. She experienced paresthesia and considerable wasting in the extremities. The patellar reflexes were abolished. After $3\frac{1}{2}$ months' treatment, consisting of subcutaneous injections of ergotin and of electric baths, the improvement was sufficient to allow the patient to resume her customary occupations.

Pathology of the Breasts.—Toulouse,[2] in a contribution on puerperal psychoses, treats of those that are associated with sucking (*psychoses of lactation*). In rare cases these follow quickly on labor, but then they are hard to distinguish from simple puerperal psychoses. The majority occur after several months of suckling in poor and weakly women. A third form follows wean-

[1] Nouv. Arch. d'Obstét. et de Gynécol., No. 12, 1895. [2] Brit. Med. Jour., Feb., 1894.

ing. Slight mental disturbance may accompany abscess of the breast, but it is then due most probably to sepsis. Mental disturbance during lactation may begin in the form of slight delirium following mental shock or simply change of diet. As a rule, however, physical symptoms appear first. The patient becomes thin and pale, and palpitations, indigestion, and insomnia set in. In 25 cases noted by Macé there was melancholia in 11, mania in 11, and partial delirium in 3. The prognosis is favorable, 20 recoveries and only 2 deaths having been noted by the above-named writer. As in puerperal mania, auto-infection probably accounts for the phenomena of mental disturbance during lactation.

Van Tussenbrock [1] describes an unusually bad case of galactorrhea following an abortion at the fifth month in a primipara. Emaciation set in, and, as no therapeutic measures were of any avail, the mammæ were amputated. Microscopic examination did not explain more than might be expected, the glandular tissue being in a very active condition. Goldberger [2] records a patient who had 2 supernumerary mammary glands, 1 in the right axilla and the other beneath the left axilla; both glands were ductless, but aspiration by a Pravaz syringe showed that they both contained milk. Hirst [3] reports a case with an unprecedented number of breasts and nipples; the woman—a negress—had 9 mammæ, all told, and as many nipples; there were 5 on the left and 4 on the right side. [There is a total of 262 cases of accessory mammary glands described in literature, but none in which the number of glands was as great as in this instance.] Anthony [4] reports a case of diffuse hypertrophy of the breasts; and Norris [5] a case of submammary abscess. Gaudier [6] found in the milk of a patient who had nodules in the breast the *staphylococcus albus* in a pure culture. He injected this culture into the breast of a nursing bitch, and 2 days later single nodules were distinguished in the glandular structure of its breasts, which gradually developed into cystic cavities; he concludes, therefore, that these cysts form the final stage of the nodules.

PHYSIOLOGY AND PATHOLOGY OF THE NEW-BORN.

The Signs of Maturity at Birth.—Frank [7] concludes that there is no one sign or set of signs which by themselves are sufficient to establish maturity. He thinks the classical reliance upon the length of the finger-nails, the presence or absence of lanugo, and the size of the epiphyses is unsafe. A subnormal temperature in a nonasphyxiated child is in his opinion indicative of prematurity. To the attainment of average length and weight he attaches much importance. Finally, he believes that the proportion between the girth about the shoulders and the circumference of the head is of considerable value. When the shoulder girth is greater that that of the head, the child is usually mature. If the circumference of the head is not at least 32 cm. the child is

[1] Rép. univ. d' Obstét. et de Gynéc., Feb. 25, 1895. [2] Arch. f. Gynäk., No. 2, 1895.
[3] Univ. Med. Mag., May, 1896. [4] Boston M. and S. Jour., Aug. 22, 1895.
[5] Am. Jour. Obst., Feb., 1896. [6] Centralbl. f. Gynäk., No. 25, 1895.
[7] Arch. f. Gynäk., 1894, Bd. 48, H. 1.

almost certainly premature. [He concludes wisely that it is often not possible to decide positively whether a child is or is not at full term.]

Respiration in the New-born.—Dohrn,[1] from a series of examinations made upon new-born children to determine the extent to which respiration is carried, has found that on the average, during the first 10 days of life, a child respires 50 times to the minute. There seems to be no difference between prematurely born children and those at term, or between boys and girls, in the frequency of breathing. During crying an infant inspires less frequently than during regular breathing. Inspiration and expiration during crying vary from 47 to 62 to the minute. The average movement in expiratory respiration during the first 10 days of life is 45 ccm. The amount of air changed in respiration is the same in children of both sexes, but is less in prematurely born children. The depth of respiratory movements increases from the first to the tenth day of life, so that the expiratory movements during the last few days of the 10 are increased 12 ccm. The reason for this increase is found in the enlarged play of the ribs, the dilatation of the bronchial tubes, and the increased respiratory necessity of the child. The depth of respiratory movements is less in the new-born than one would expect. It is evident that the first respiratory movements do not unfold the lungs, but that this process is a very gradual one.

Asphyxia Neonatorum.—The successful employment of Laborde's method of rhythmic traction of the tongue in asphyxiated children is recorded by Erskine,[2] Russel,[3] and Cameron.[4] The treatment of asphyxia by inversion, a method first advanced by Nélaton, is urged at length by Bissell.[5] The effect of inversion effectually aids, by the action of gravity, the emptying of the contents of the liver into the heart, nourishing in turn that organ, and by the continued action of the same law the flow from the heart to the medulla is also materially assisted. Consequently, a greater quantity of oxygen is supplied to the nerve-center in a given length of time than would be if the body were kept in any other position.

Inanition Fever in the Newly Born.—Holt[6] reports a case of this nature, and remarks that the possibility of an infant which is being put regularly to the breast dying of starvation during the first few days of life is not one of those ideas which usually presents itself to the mind of the physician. The mother's breasts in the reported case yielded very little milk. Under a wet-nurse and the free administration of a prepared food the child rapidly improved. Observations have been made on the subject at the Sloane Maternity and the Nursery and Child's Hospitals, which have established the fact that it is not uncommon for the temperature to rise in the newly born during the first few days to 102° to 104° F., unaccompanied by any evidence of local disease, and that it falls again when the secretion of milk on the part of the

[1] Zeit. f. Geburtsh. u. Gynäk., Bd. 32, H. 1, 1895.
[2] Med. and Surg Rep., 1895, lxxii. 525.
[3] Therap. Gaz., Aug. 15, 1895.
[4] Montreal Med. Jour., 1895, vol. xxiii. No. 12.
[5] Med. Rec., Nov. 30, 1895.
[6] Am. Gynæc. and Obst. Jour., Oct., 1895.

mother is freely established. It is also arrested by proper artificial feeding. A rapid fall of temperature takes place, often to normal, in a few hours. At the Nursery and Child's Hospital, 20 of 200 infants, taken successively, had the fever during the first 5 days, and at the Sloane Maternity 135 out of 500 successive children born in the institution. The fever usually reached its highest point from the third to the fourth day. The average loss of weight amongst the healthy children was 10 oz.; this loss was exceeded in those children who had the fever by several ounces. The maximum loss was 28 oz. As a rule, when the temperature fell to normal the children began to put on weight. The symptoms are a hot, dry skin, marked restlessness, dry mouth, and a disposition to suck anything within reach vigorously, everything indicating extreme thirst—high temperature, considerable prostration, and weakened pulse. In the milder cases there is only unusual restlessness and crying. The symptoms disappeared with great rapidity when the children were nursed or fed. The main treatment, in addition to proper feeding, is to give water up to an ounce every 2 hours if required by the thirst of the child. This should be done in every case in which the temperature reaches 101° F. In case the temperature does not at once begin to fall, the infant should be put upon another breast or artificial feeding begun.

Scorbutus from Sterilized Milk.—Starck[1] points out the danger of scorbutus following a prolonged use of highly sterile milk. He calls attention to the fact that the presence of certain kinds of bacteria in the milk is not harmful, as even breast milk is not always free from bacteria. He would limit the use of sterilized milk to seasons of very hot weather and to the dwellings of the poor.

Nephritis in the Newly Born.—Jacobi[2] describes cases of this disorder in infants, and summarizes his observations as follows: Nephritis is not rare in the newly born. The use of the centrifuge enables us to recognize cases of nephritis in infants which were formerly considered simple or transient albuminuria. The fragility of the blood-vessels, the small size of the renal capillaries, the inability of the infant's intestine to expel toxic contents, and the large size of the lymphatics and blood-vessels of the intestine all favor the absorption of toxins, resulting in nephritis. The principal forms of this condition in infants are the congestive, resulting from feeble heart, asphyxia, and exposure; the obstructive, from rapid decomposition of the blood, with the formation of retrograde products; and the irritative, caused by infarctions of uric acid or hematoidin, by purpura or intestinal hemorrhage, or the microbes and toxins of enteritis and of infectious maladies.

Tetanus Neonatorum.—Dorland[3] reports a case of tetanus of the newborn child, the infant being of colored parents; the disease developed on the fifth day, and terminated fatally on the morning of the seventh day.

Vaginal Secretion of New-born Infants.—Vahle[4] gives the results

[1] Münch. med. Woch., No. 42, 1895.
[2] N. Y. Med. Jour., No. 3, 1896.
[3] Phila. Polyclinic, Aug. 24, 1895.
[4] Zeit. f. Geburtsh. u. Gynäk., 1895, Bd. 22, H. 3.

of his examination of the vaginal secretion of new-born infants to determine the presence or absence of bacteria. He finds that for 2 hours after birth the vulva and vagina are sterile. From this time until the third day germs are occasionally found, and after the third day they are present in most cases. In 4% of cases staphylococci were discovered, while in 14.6% streptococci were isolated.

Icterus Neonatorum.—Schreiber[1] writes on Quincke's theory of the origin of icterus neonatorum. Quincke has declared for the old explanation of Peter Frank's, that the icterus of the new-born arises from absorption of bile from the contents of the large intestine, and he has supported it on new grounds. The chief point is the patency of the ductus venosus Arantii, through which the absorbed bile-pigment reaches the body without having to pass through the liver. To this is added "the increased secretion of bile-pigment owing to the destruction of numerous blood-cells, the irregular relations of urinary secretion in the new-born, the richness of the meconium in bile-pigments, and the absence of reduction of bilirubin to urobilin, owing to the want of intestinal decomposition." Schreiber holds Quincke's theory as a very happy explanation, and supports it against the attacks of Kehrer and Stadelmann.

Ophthalmia Neonatorum.—Budin[2] again recommends the prophylactic treatment of ophthalmia neonatorum by silver-nitrate solution of 1 : 150 strength; in his hands it has given most satisfactory results. Of 2004 children treated with this solution, there were only 2 cases of purulent ophthalmia and 7 of secondary conjunctivitis. These results may be explained in part by the precautions taken. These include a bath and vaginal injection of mercuric chlorid 1 : 4000 before confinement if this be not too far advanced; drying the infant's eyes and introducing several drops of the 1 : 150 silver-nitrate solution just after birth; and immediate isolation of the mother and child if the slightest complication occur in either.

Skin-diseases in the New-born.—Schmidt[3] reports 3 cases of the rare fetal malady, sclerema neonatorum. In the blood of all these children bacteria were isolated. The capillary vessels were crowded with round bacteria, which were also found free in the connective tissue. These germs were also present in the parenchyma of the lungs and in the subcutaneous fibrous tissues. [It is probable that this disease may properly be considered an infection, but further bacteriologic researches are desirable.] Cabot[4] reports the case of an infant, 14 months old, suffering from congenital ichthyosis. This case was of unusual interest from the length of time which the child survived its birth. Born at the seventh month, it did not die until the fifteenth month of its life. H. M. Morton[5] records a case of dermatitis exfoliativa neonatorum (Ritter's disease), in which the epidermis exfoliated at 3 different times, the infant eventually recovering completely.

[1] Berl. klin. Woch., xxxii. 25, 1895. [2] Arch. de Tocol. et de Gynéc., May, 1895.
[3] Zeit. f. Geburtsh. u. Gynäk., Bd. 22, H. 2, 1895. [4] Med. Rec., July 6, 1895.
[5] N. Y. Med. Jour., June 8, 1895.

GYNECOLOGY.

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Principal Features of the Year's Work.—It is doubtful whether in any other department of medicine more important advances have been made or more vital questions discussed during the past year than in abdominal and pelvic surgery. Aside from the pressing points of dispute in the major operative procedures which have distracted the gynecologists during the past two or three years, and which are as yet unsettled in all their details, other subjects of no less interest, although not involving the use of the knife, have claimed more than the ordinary amount of interest and attention. Bacteriology has made a great advance in gynecologic work, and the microscope is now to be recognized as an important aid in the forming of gynecologic diagnoses. Not only has it been of service in the recognition of early stages of the various forms of malignant uterine diseases, but by its use the rarer and semimalignant—as they may properly be called—forms of ovarian cystomata, the ovarian papillomata, may be recognized, and the presence of tubercles in the uterus, tubes, and ovaries demonstrated. Stroganoff and others have employed it in the study of the uterine and cervical secretions; Döderlein in his investigations upon the normal and pathologic secretions of the vagina, both of nonpregnant and pregnant women; and others as a means of diagnosis and guide to treatment in their study of the contents of tubal retention-cysts and ovarian abscesses. The changes in the uterine mucosa subsequent to the operation of castration have also been studied under the eye of the microscope, and valuable contributions to our knowledge made. The importance of urinary analysis as an aid in diagnosis and a guide to the institution of proper methods of treatment has been enlarged upon. By proper attention to this exceedingly valuable means of diagnosis the most appropriate time for operation may be selected, and in nonoperable cases the most suitable dietary selected and many of the distressing clinical manifestations corrected. Cystoscopic examination of the bladder and catheterism of the ureters and kidneys are fully established as more delicate means of differentiating between the obscurer pathologic conditions of the urinary tract in women; and this hitherto but little explored region of the organism is steadily yielding up its mysteries to the indefatigable workers in this line of pelvic surgery. The

methods of cystoscopy and ureteroscopy have been much perfected and facilitated during the twelve months just elapsed. Bicycling for women, after passing through a storm of active opposition on the part of the nonprogressive and ultraconservative obstetricians and gynecologists, is now recognized as one of the most valuable and tangible methods of securing the necessary amount of out-of-door exercise. Like all other agents for good, it is as potent for evil if abused or used in excess, and the teaching of the day is to encourage the proper posture to be employed and the most suitable saddle and instrument to adopt. The literature of the subject is as yet very scanty, but that which is accessible is of the highest order of merit, and shows that the new variety of physical culture is getting a hold upon the minds of the most competent observers in gynecologic and obstetric work. Finally, as may be expected, the recently agitated subject of vaginal major surgery has been prominently before the mind of the gynecologist. Hysterectomy by the vagina for pyosalpinx and other morbid conditions of the adnexa; the operation of anterior kolpotomy for the relief of uterine displacements and ovarian and tubal disease, including extrauterine gestation; and the operation of vaginal celiotomy—all have offered themselves as substitutes for the time-honored abdominal section. While they have won for themselves appreciable numbers of enthusiastic followers, abdominal section still continues as the sheet-anchor of pelvic surgery, and doubtless will so continue as long as the knife of the surgeon is in demand for the relief of the peculiar woes to which womankind is subject.

PRELIMINARY AND GENERAL CONSIDERATIONS.

Neurasthenia in Women.—Probably the most distressing condition into which a woman can fall is that described under the various captions of neurasthenia, nerve-exhaustion, or the invalid habit, although A. J. C. Skene[1] regards the latter condition as quite distinct from hysteria, neurasthenia, and fancied ailments such as occur among those given to introspection. He states that disappointed maids and "spoiled" wives form the largest number of those afflicted with this complaint. They complain of strange nerve-symptoms, general weakness, and obscure pelvic pains that incapacitate them for any kind of mental or physical work. As a rule, they have suffered from some real affection which they cling to long after recovery. The only derangement usually found is the lax, soft tissues that come from disuse. He regards the direct causes as twofold—either over-treatment of slight affections of the pelvic organs or unsuitable treatment of trivial affections of the nutritive and nervous systems. He believes that the rest-cure, with forced feeding, so often employed in cases that do not require it, is responsible for many examples of the invalid habit. On the contrary, this condition should be treated with the occupation-and-exercise cure, and with well-regulated gymnastic and mental exercises. Skene believes that dancing, carriage-riding on moderately rough roads, and horseback riding are better borne and

[1] Brooklyn Med. Jour., Sept., 1895.

more suitable than the less active exercises. He would prefer dancing to walking, and horseback riding to bicycling.

Neurasthenia proper, according to Frederick,[1] is an exhaustion of the nervous system—especially the sympathetic nervous system—due to malnutrition, systemic poisoning from pus, the nerve-depressing influence of constant pain, or the continuous drain of blood or mucopurulent discharges. These are the cases most suitable for the Weir Mitchell rest-treatment carried out quite rigidly. Lithemia, also, as indicated by Mann,[2] may be responsible for this condition, and an examination of the urine in these obscure cases may reveal the true condition when other diagnostic measures have failed. Some of these women suffer from severe neuralgic attacks, and Cumston[3] states the following types of neuralgia as those most frequently met with in association with uterine lesions: 1. Facial; 2. Intercostal; 3. Sciatica; 4. Abdominolumbar. [The neurasthenic is one of the most distressing patients with whom the gynecologist is called upon to deal, and any investigations that will throw light upon the proper management, hygienic and therapeutic, of this disease, if such it may be called, will be more than welcome. Unfortunately these patients are generally undesirable, and wander from doctor to doctor with but little resultant improvement in their condition.]

Functional heart-disorders are occasionally noted, John D. Williams[4] having found 25 cases in a little over 300 women whose hearts and pelvic organs he has examined during the last 6 years. Of these 25 cases, the uterus was affected in 11 instances, in 8 it being displaced in various directions. The other 3 women were suffering from uterine fibroids. Two of the 25 cases were instances of cervical stenosis, and in 6 cases the lesion was ovarian; 1 suffered with vaginismus, 2 from anal fissure, and of the remaining 3, 1 had tachycardia following an attack of influenza and pelvic peritonitis; the second had coccygodynia; and the third a floating kidney. In all of these women relief followed treatment directed to the exciting cause of the heart disorder.

Finally, the relation existing between pelvic diseases and mental disorders has been treated by Davenport,[5] Hobbs,[6] and Everitt.[7] Davenport thinks that physicians too often ascribe the mental condition of insane women to pelvic disease, when in reality she often finds the pelvic organs in these cases in a fairly healthy condition. [Rather than being benefited by the removal of the uterus and ovaries, it is a question whether these women are not made worse by the premature onset of the menopause. Davenport is right when she says that in the light of our present knowledge no amount of pelvic or other physical disease will cause insanity if the condition for this disorder do not exist in the brain. However, in a certain proportion of cases removal of the uterus or its appendages is beneficial, and if the pelvic disease be

[1] Am. Jour. Obst., Dec., 1895.
[2] Ann. of Gyn. and Pædiat., June, 1895.
[3] Ibid., Sept., 1895.
[4] Lancet, Nov. 2, 1895.
[5] Med. News, Oct. 5, 1895.
[6] Am. Med.-Surg. Bull., Mar. 28, 1896.
[7] North-western Lancet, 1895, No. 4, p. 691.

present, the patients should be given this chance of recovery.] Everitt also states that pelvic examination of insane women in the north-western portion of the United States fails to show many or grave lesions of the sexual organs. Hobbs has noted marked mental improvement in 19 cases in which the pathologic condition was relieved by operation.

AFFECTIONS OF THE VULVA.

Kraurosis Vulvæ.—Longyear[1] objects to Tait's appellation for this disease, "serpiginous vascular degeneration," on the ground that it refers to one part only of the general process, in which a strangulation of the blood-supply occurs. He much prefers Breisky's term of kraurosis vulvæ (shrinking of the vulva), which expresses merely the general appearance of the diseased parts without attempting to describe the complicated pathologic condition. The morbid process, he believes, is due to some defective nerve-action, probably of reflex origin. All of the cases observed by him have been in women who had passed their fortieth year, and the symptoms of the disease were associated with those of the menopause. The clinical features are characteristic. The hair around the vulva is thin and dry, and late in the disease almost entirely absent; the vulva is small and infantile, the labia minora small and shrunken, and late in the disease smoothed off to almost an even surface with the labia majora; the integument is pale and bloodless, while the mucocutaneous surface is studded with a number of very sensitive, irregularly-shaped, reddish-brown spots, which on close inspection will be seen to be slightly depressed below the surface on which they lie. The parts are usually dry, and sometimes the mucous surface is cracked and abraded; occasionally a slight, brown, purulent discharge is seen. The brown spots terminate abruptly with the margin of the introitus vaginæ, being confined entirely to the vestibule. They disappear later in the disease, the mucosa becoming white and skin-like in appearance. The perineum is rigid, and cannot be retracted. Longyear adds to the pathologic features of the disease a band of fibrous tissue situated beneath the cutaneous surface, just within the vulvar orifice, but outside of the vaginal inlet. It is entirely separate from the skin and mucosa, and is an evident result of degeneration of the subcutaneous and submucous cellular tissue. He believes that the pathologic changes constituting the disease begin with this fibrous-tissue formation, and that the changes in the skin and mucosa are to a considerable extent a result of this constantly increasing condition of fibrous degeneration underlying these structures. This new formation, by replacing the loose cellular tissue through which the nutrient vessels of the skin and mucosa pass, by gradual and continual contraction results in the strangulation of the blood-vessels, and thereby produces the ecchymoses that are to be noted. To effect a cure it is necessary to eradicate the band of fibrous tissue. The operation for this purpose is made in a manner analogous to Whitehead's operation for hemorrhoids, all of the diseased mucosa containing the spots being removed *en masse*, and healthy mu-

[1] Am. Jour. Obst., Dec., 1895.

cosa from above the vaginal inlet dissected loose from its basic attachments and slipped down and sewed to the skin in its place. He recommends the entire removal of the fibrous tissue underlying the diseased mucosa.

Vulvitis.—Edwards[1] describes the condition designated by Johnstone as *trachoma of the female genital tract*, as an obliterative inflammation—a form of vulvitis. The disease cannot be traced to any venereal or microbian influence. It may occur in young or old, virgins or multiparæ. The 8 cases that have come under the author's observation have presented themselves only in a chronic form, and in three varieties, papillary, follicular, and mixed trachoma. No acute case has made itself evident. No satisfactory etiology of the disease is offered. Six of the cases referred to were in women of advanced years, a seventh in one of middle life. Bearing upon the etiology, 1 case developed immediately subsequent to a panhysterectomy, while 2 gave a distinct history of antecedent cystitis.

The clinical manifestations of the disease are very similar to those of trachomatous inflammation of the eyelid. Beginning in the region of the clitoris, it extends downward over the entire vulva, and is apt to involve the urethra and vagina. In its early stage the parts present a peculiar and characteristic appearance, not unlike the submucous or subcutaneous hemorrhage of purpura rheumatica. The surrounding tissues are apt to be anemic, but the papillæ stand up like sago grains, and a slight touch is apt to produce bleeding. After the disease has existed for a time the parts become fissured, and the thin, ichorous discharge usually present is somewhat diagnostic. Later, when diffuse scar-tissue results, it is called *trachoma deformans*. In some cases the normal contour of the vulva is obliterated, the labia minora first adhering to the larger labia and then becoming obliterated by scar-tissue, the vaginal outlet thus becoming much contracted. These cases do very poorly even under treatment. The treatment recommended is to keep the parts well cleansed with either a 5% pyrozone solution, a saturated boric acid solution, or a 20% salicylic acid solution; the parts may then be dusted over with compound stearate of zinc. As recommended by Johnstone, an ointment of yellow oxid of mercury, 4 to 10 gr. to the ounce, may be used twice a day as well.

Cumston[2] recommends tepid vaginal irrigation of about a quart of a 1 : 4000 solution of potassium permanganate, once daily, as an excellent curative remedy for vulvitis, while in nonspecific vulvovaginitis he claims excellent results from carbolated camphor (made by adding 1 part in weight of phenol to 3 parts camphor, allowing the mixture to stand 24 hours, and then filtering through gauze). Another very good preparation is a 5% watery solution of ichthyol or thiol.

The vulvovaginitis of little girls is best treated by potassium permanganate as just given, only a *rubber male catheter* should be employed instead of a glass irrigation-tube.

Herpes Pudendalis.—For this rare eruptive disease in the genital

[1] South. Calif. Pract., vol. x. No. 12, p. 447. [2] Ann. of Gyn. and Pædiat., Nov., 1895.

region Carstens[1] uses an ointment of 30 gr. of tannic acid to the ounce of cold cream, the mixture to be applied frequently during the day. Many cases seem to be of malarial origin, and in these he gives quinin and Fowler's solution.

Absorptive Power of the Vagina.—Coen and Levi[2] made a number of experiments on women with various genital diseases in pregnancy and febrile conditions, and in women whose uteri were removed by vaginal hysterectomy, as to the absorptive powers of the vagina. They obtained the following results: potassium iodid is readily absorbed; a tampon saturated with a 20% solution will give within an hour an iodin reaction to the urine. The maximum of excretion takes place in 20 hours, and in 48 hours the excretion ceases. The vaginæ of patients with fever have greater absorptive power than those of others. The same holds good of pregnant women. The vaginæ of women who have undergone hysterectomy show the same absorptive capacity as those of others. Iodoform is absorbed in very small quantities; the excretion commences in 7 hours and continues for 24 hours. To obtain a greater absorption fresh iodoform must be constantly introduced, and the first introduced left in the vagina for several days. Salicylic acid is quickly absorbed in fairly large quantities. It appears in the urine within an hour and disappears in 24 hours. Salol is quickly absorbed, and is to be detected in the urine for a long time. Antipyrin is also quickly absorbed. It appears in the urine in 1½ hours and remains for 48 hours. The antipyretic effect is less than when given by the mouth. [In general these investigations prove that the vagina has an absorptive capacity that is increased in the pregnant, the puerperal, and the febrile states.]

Vaginal Secretions in the Nonpregnant.—Menge[3] has made a series of observations as to the bactericidal properties of the vaginal secretions in nonpregnant women, and has demonstrated the fact that in 44 out of 150 women there were no pyogenic microorganisms, either at the fundus or the introitus vaginæ. He next proceeded to investigate the fate of such germs when introduced experimentally. On 35 women he made 23 experiments with bacillus pyocyaneus, 30 with staphylococcus pyogenes, and 27 with streptococcus. The result was the same in all cases: after a varying period the vagina was found to be free, and the question as to whether the vaginal secretion was acid or alkaline did not affect the result. He concludes that the germicidal process depends upon several factors that rank in order of importance as follows: (1) The antagonism between the normal bacilli of the vagina and the microorganisms that happen to penetrate there; (2) The products of the vaginal bacilli; (3) The acidity of the vaginal secretion; (4) The properties of the secretion of the anatomic elements of the vagina; (5) Leukocytosis; (6) The absence of free oxygen from the vagina. [This seems to indicate that the virulence of bacteria after parturition depends largely upon their ready access to the system through the lacerations of the birth-canal.]

[1] Physician and Surgeon, Oct., 1895.

[2] Livorno, Collegione ital. di lettere sulla med., Serie vii. No. 2; and Centralbl. f. Gyn., 1894, No. 49.

[3] Lancet, Apr., 1895.

Vaginitis.—Under the name of *seborrheic vaginitis* or *vaginal seborrhea* Strassmann[1] describes a peculiar form of catarrh of the vagina frequently met with in stout women, old maids, and during pregnancy. This affection, which may be considered as simply due to an exaggeration of the normal secretion of the vagina, is characterized by a slight discharge, mainly consisting of whitish, fatty clots, in which are found agglomerations of pavement epithelium. Recovery rapidly follows vaginal injections of warm water, to which a tablespoonful of sodium bicarbonate has been added.

As a vaginal antiseptic Rolland[2] employs a powder containing eucalyptol, 1 part; thyme oil, 1 part; iodoform, 4 parts; powdered cinchona, 4 parts; boric acid, 4 parts; calcined magnesia, 4 parts. This is used after a vaginal douche of mercuric chlorid 1 : 2000. LeBlonde and Lévy[3] have experimented as to the value of a galvanic current in the cure of vaginitis. They have found that when the anode is introduced into the vagina filled with salt water, it decomposes the liquid, kills the microbes, and stimulates an abundant secretion of mucus which washes out the bacteria contained in the glands. From 5 to 13 séances given twice a week are required to effect a complete cure, the strength of the current varying between 25 and 80 milliampères. [If this be true, this affection is probably the only condition in gynecology in which electricity may be successfully and satisfactorily employed.]

[Gonorrhea in the woman is now very generally recognized as the truly serious condition that it is, and much has been written upon it.] Probably the most important paper of the year is that of Pryor,[4] in which the importance of treating the disease at the outstart, and thereby preventing its extension, is urged. For the various localizations of the disease he recommends the following treatment: *Gonorrheal urethritis* should be actively treated from the start; internally alkalinize the urine; locally apply daily a solution of silver nitrate, 10 gr. to the ounce, preferably through a slender speculum after cocain has been applied. The strength of the silver nitrate may be reduced one-half and this applied less frequently as the disease subsides. Great care should be taken lest the application reach above the sphincter vesicæ. The vulva should frequently be bathed with a $\frac{1}{2}\%$ lysol solution, but no douching is allowable. For *gonorrheal cystitis* give 75 gr. to a dram of sodium benzoate daily. Wash out the bladder with a supersaturated solution of boric acid twice daily, using large quantities and frequent flushings at each sitting. The bladder should be distended with the solution and left so. Use a single catheter for the lavage. For the *gonorrheal ureteritis* the sodium benzoate should be used internally, and the bladder washed only if it be at the same time acutely affected. The ureter may be washed out with boric acid if the bladder be not too sensitive. The urine should be rendered antiseptic, and the quantity increased by the ingestion of lithia-water in large quantities. For *gonorrheal vulvitis* paint daily every part thoroughly with a solution of silver nitrate (20 gr. to the ounce), allowing it to dry. In cases with tender

[1] N. Am. Pract., Mar., 1896.
[2] Med. Week, 1895, iii. p. 454.
[3] N. Am. Pract., Mar., 1896.
[4] Am. Gyn. and Obst. Jour., Sept., 1895.

mucosæ, as in blonds and very young women, every other day is sufficient. To prevent extension the vagina is to be packed with iodoform gauze, previously wrung out in 1 : 5000 bichlorid solution, and this must be renewed once in 3 days. The vulva should be bathed every 4 hours in a lysol-solution. The author believes in the early entire excision of the vulvovaginal glands, when infected, as the only way to permanently eradicate the disease from them. For *gonorrheal vaginitis*, the patient resting in the lithotomy position, the vagina is opened with anterior and posterior retractors, and every part of the mucosa is painted with a solution of silver nitrate (30 gr. to the ounce) and the vagina packed with gauze as before. This is repeated every other day for 2 more treatments, after which the gauze alone is used. *Gonorrheal endocervicitis* occurs 5 times as often as vaginitis. The cervical mucosa is to be touched daily with iodin on a cotton applicator passed up to the internal os, and the vagina packed as before. This treatment must be continued for many weeks. In very chronic cases it may be necessary to amputate the mucosa by Schröder's method. If caustic applications or instrumental examinations be employed, gonorrheal endometritis may follow. For *gonorrheal endometritis* operate at once after thoroughly dilating the cervix to ½ in., incising if necessary ; wash out the uterus with boric acid, then swab the cervix with 5% phenol, after which again dilate. Thoroughly curet the uterus, and wash out all débris with an irrigating catheter, using plain water only. If a strong antiseptic solution be used, a slough is produced, which acts as a culture-medium for the remaining gonococci. The uterine cavity should not be swabbed out with iodin or phenol. The uterus and the vagina are then packed with almost dry iodoform-gauze. In 5 days this is removed and only the vagina repacked. The author claims no temperature, pain, or tubal involvement as a sequence. For *gonorrheal salpingitis* (acute) the same method of treatment is to be employed as for the endometritis. Nothing but extirpation of the tube is effective if a pyosalpinx be present. [The foregoing may be accepted as a concise symposium of the accepted methods of treating the various forms of gonorrhea in the woman.]

[Janet's treatment of gonorrhea with potassium permanganate has given excellent results in the hands of many men.] In the treatment of the first stage a urethral and vesical irrigation with 1 : 1000 to 1 : 2000 solution of potassium permanganate should be made. The quantity of the solution should be a liter or more, and the treatment should be practised daily for from 10 days to 2 weeks. The discharge at first becomes more watery in character, and the gonococcus disappears after half a dozen irrigations have been made. Janet advises that the patient be watched for a week after the discharge has ceased, without treatment, and then a test of the cure be made by applying a 1% solution of silver nitrate to the urethra, and having the patient drink several glasses of beer. If the gonococcus be absent in the resultant discharge, the disease may be considered as cured. In the second stage of the disease Cumston[1] recommends a 1 : 20,000 solution of mercuric

[1] Ann. Gynæc. and Pædiat., No. 9, 1895, p. 617.

chlorid for irrigation of the bladder; in the third stage a 1% solution of ichthyol is the best preparation that can be used as an injection. The treatment of Skene's and Bartholin's glands should be accomplished by first evacuating the contents by pressure with the finger, and by means of a syringe with a suitable needle, as Auel's eye-syringe. Then a 1% solution of potassium permanganate is injected into the orifice of the gland. About 1 c.c. is a sufficient quantity. If this does not answer, the galvanocautery is advised by Janet. A 1:3000 or 2000 potassium permanganate solution should be used for intrauterine irrigation, and the level of the solution should be about 4 feet above the patient.

As to the diagnostic value of the gonococcus, Brewer[1] concludes that when the pus from an acute or subacute urethritis is examined by the microscope and diplococci in large numbers are found in the protoplasm of the pus-cells clustered about the nuclei, and these organisms lose their stain when treated by Roux's method, they are surely gonococci. *Roux's method* of staining is as follows: The specimen, after being spread out in a thin layer on a glass slide and heated, is treated by a solution of methyl blue, gentian violet, or fuchsin. This is subsequently washed off, and the specimen heated with Gram's iodoiodid solution, mounted, and examined. All forms of diplococci, except the gonococcus, retain their color when subjected to this process.

Vaginismus.—As regards the etiology of this affection, Gunning[2] considers it the result of pressure on, or irritation of, the spinal cord or its membranes at the end of the dorsal section and also the lumbar enlargement, with the spinal nerves; this pressure is reflected through the sympathetic nerve and by the hypogastric plexus and the pudic nerve, producing a local nervous irritation, or a neuromata of the nerves themselves, or of their peripheral ends, supplying the walls of the vagina with their fine nerve-filaments, both motor and sensory, as far as the external orifice and hymen, and also distributed to the clitoris, vagina, bladder, rectum, uterus, and ovaries. As a consequence, a low vitality of these parts exists, with poor nutrition and increased sensitiveness of the parts.

Vulvar and Vaginal Tumors.—A number of interesting cases of neoplasmata of these organs have been reported. That seen by Kidd[3] is especially noteworthy on account of its great variety. It was a case of so-called elephantiasis of the vulva (Fig. 106), in which there was no suspicion of a syphilitic origin, nor had there been previous erysipelatous attacks; the patient had never been abroad, hence the presence of the *Filaria sanguinis hominis* could be excluded. The patient was 33 years of age; she attributed the growth to a fall 13 years previously. The tumor commenced in and involved all the tissues of the right labium and hung down more than halfway to the knees. It did not grow quickly at first, but increased more rapidly in the last 18 months. There were no disorders of menstruation or micturition. The tumor was removed through an elliptic incision, and weighed, in the

[1] N. Orl. M. and S. Jour., July, 1895. [2] Am. Gynæc. and Obst. Jour., Dec., 1895.
[3] Med. Press and Circ., vol. cxii. No. 11, Mar. 11, 1896.

recent condition, 5½ lb. An examination of the growth yielded the following points: The tumor was whitish in color, covered close to the pedicle with rather dark-colored skin, from which grew a few long hairs, while elsewhere it was covered with epithelium which had the character of mucous membrane.

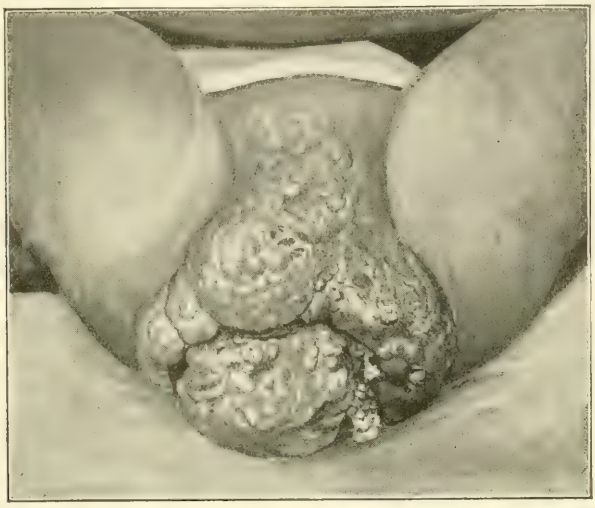


FIG. 106.—Elephantiasis of the vulva (Med. Press and Circ., Mar. 11, 1896).

It was lobulated and very irregular in shape, with numerous papilla-like excrescences, which caused it to resemble a gigantic wart; the consistency was rather soft. Between the larger lobes were curious sinuous cavities, some actual passages or canals running through the mass from near the pedicle at one end to the free convexity on the other. Part of the skin covering the base of the tumor was covered with innumerable small pedunculated protuberances like fungiform papillæ. Microscopically, the tumor consisted of a somewhat edematous fibrous tissue of loose texture containing so many lymph-clefts that in places one might almost term it a lymphangioma. There were also very numerous newly-formed blood-vessels. Around the lymph-clefts were many collections of lymphoid and epithelioid cells. Sections of the papilla-like protuberances showed essentially the same appearances. The surface was covered with stratified epithelium, which, from its slightly-developed horny layer and absence of hair-follicles, may be said to constitute a mucous membrane. [It is probable that this growth was a variety of molluscum fibrosum, and not a true elephantiasis.]

Cumston,[1] in speaking of primary *malignant tumors of the clitoris*, states that epithelioma of that organ usually occurs after the menopause. Former labors, trauma, syphilitic lesions, psoriasis, eczema of the vulva, and vaginal discharges are given as the predisposing causes. The affection appears in all classes of society, though it is mainly the result of poverty and vice. Its development is insidious, the patient subsequently complaining of heat and burning at the vulva; again, a pruritus vulva is often an early sign, accom-

[1] Ann. of Gynæc. and Pædiat., 1896, No. 5.

panied by more or less fetid discharge. Upon examination a tumor or an ulceration is detected—the former more frequently—which proves to be a nodular type of epithelioma. At first limited to the clitoris, the growth tends to invade the neighboring parts. The inguinal glands are sometimes involved. Simple or melanotic sarcoma, as also myxosarcoma, of the clitoris has also been occasionally met with. These sarcomata are usually rapid in growth. Neoplasms about the clitoris generally give rise, by extension, to pain and difficulty in micturition, as well as in coition and walking. The patient is usually unaware that such a condition is present until these growths have materially progressed, and it is then that the physician is first consulted. Complete excision or dissection by means of the knife and thermocautery, preferably the former, is the line of treatment advised.

[*Cystic tumors of the anterior vaginal wall*, occupying the space beneath the vesical wall, are of interest on account of their rarity. Huguier, Virchow, Guérin, Preuschen, Poupinel, and others believe that these cysts generally derive their origin from glands, and are therefore retention-cysts. Eustache, Tillaux, and Thallinger believe that they are hygromata; Veit, that they derive their origin from the terminal extremity of the Wolffian canal (Gärtner's duct); Courty thinks excessive coitus is the most frequent cause; while Cullen believes that in addition to the causes already alluded to (embryonic, traumatic, or glandular), there may be a true urethral diverticulum in which all the urethral coats take part; that they may be caused by the dilatation and possible occlusion of Skene's tubules; that they may be due to the arrest of calculi in the urethra, a diverticulum forming to accommodate the same; or that a suppurating cyst situated in the urethrovaginal junction may have burst into the urethra.]

According to Collyer,[1] these cysts may occur in any portion of the vagina, as well as in the external genitalia. Their most frequent site is found to be in the pouches of the vagina near the uterine attachment, and they are often overlooked, frequently rupturing and leaving the cyst-walls to cicatrize and form contracted bands in the vagina; these bands extend from the cervix anterolaterally, sometimes one on each side, and frequently on one side only. Naturally enough, these bands may be mistaken for probable cicatricial scars of a former rent in the vagina. The clinical history is usually unaccompanied by symptoms other than occasional inconvenience, and the accidental discovery of a bluish, semitranslucent tumor in case of a physical examination for some other condition that may have arisen. When these cysts spring from the lower and outer walls of the vagina, the attention of the patient is usually attracted by the protrusion, and, in the majority of cases, by the inconvenience experienced during coitus. The general impression in the patient's mind is that she has prolapsus, and it is of common occurrence for the physician to carelessly diagnose cysts of the anterosuperior wall of the vagina as cystocele, and those posteriorly situated as rectocele. These cysts are found singly of varying sizes and shapes. Those in the upper vagina are usually ovoid; when

[1] Am. Med.-Surg. Bull., Apr. 25, 1896.

small they are round. When found on the wall of the vagina their most frequent shape is elongated, the cysts varying in thickness and in their course of direction. The cysts found in the lower vagina seem to have thicker walls, and hence lose their characteristic bluish, semitranslucent color, and have very much the same appearance as the vagina. Fluctuation is present in all instances, but owing to the locality it is often imperceptible and deceptive. The tenseness varies in different tumors; the larger kind is less tense and compensates itself better. These cysts contain a white or straw-colored fluid, such as is ordinarily found in simple cysts. Only when they have become infected do they contain pus.

Collyer states that the positive diagnosis of cysts can always be corroborated without the least danger (if the ordinary necessary aseptic precautions are taken) by the use of the hypodermic syringe. It seems needless to state that, with cysts simulating cystocele, due care must be observed to avoid aspirating the bladder by passing directly through the cyst into that cavity. This mishap may easily be avoided by introducing a sound into the bladder to determine the relative thickness of the suspected tissue. In differentiating vaginal cysts it is necessary to classify them by positions: First, the superior uterovaginal; second, the anterior vaginal; third, the posterior vaginal; and fourth, the lateral vaginal. In the first, or *superior uterovaginal*, the cystic signs are very typical, though it is well to consider the possibility of pelvic abscess, prolapsed ovary or tube, ovarian cyst, tubal cyst, hematoma, and hematocele. Second, the *anterior vaginal:* The most frequent and usual differentiation is cystocele, urethrocele, hypertrophies, suburethral abscess, and cellular abscesses. Third, the *posterior vaginal:* In this class differentiation must be made between rectocele, varicocele, hypertrophies, and abscesses. Fourth, the *lateral vaginal:* Cysts must be differentiated from hypertrophies, vulvovaginal cysts, abscesses, cellular exudates, and the divided ends of sphincter muscles. Cysts located in the anterior vaginal wall are often richly supplied with arteries and veins, and due care must be exercised to ligate these vessels as soon as they are met with in order to prevent serious hemorrhage.

The *symptoms* of vaginal cyst are painful micturition, and, after the tumor has reached certain proportions, profuse leukorrhea and prolapse of the anterior vaginal wall, accompanied by a constant dragging pain. Two cases are reported by Wiggin,[1] 1 by Collyer,[2] and 1 by Geyl.[3] In the first of Wiggin's cases, a prostitute 26 years of age, the tumor was 3 by 2 inches, situated on the anterior vaginal wall, slightly posterior to the labia minor; it was sessile, but somewhat movable. It contained about 4 ounces of a glairy, semitransparent fluid. In the second case the tumor was found on the anterior vaginal wall, beginning at the lower margin of the meatus urinarius and extending about $1\frac{1}{2}$ in.; it was 1 in. in breadth. An opening into the urethra was discovered, and the tumor could be partially emptied through this opening. It contained a brownish fluid. The cyst in Geyl's case was the size of a hen's

[1] N. Y. Med. Jour., July 13, 1895. [2] Am. Med.-Surg. Bull., Apr. 25, 1896.
[3] Centralbl. f. Gynäk., No. 44, 1894.

egg, and was found in a woman past the climacteric. It contained an opaque brownish-yellow fluid. The vaginal wall covering the cyst was not of normal structure throughout; at some points it presented a sinking-in of the superficial epithelia, forming a large irregular mass composed mainly of indifferent epithelial cells; in short, it showed a glandular formation of the vaginal epithelium. This glandular process extended deep into the cyst-wall, form-



FIG. 107.—Cyst of anterior vaginal wall simulating cystocele (Am. Med.-Surg. Bull., Apr. 25, 1896).

ing similar structures. Collyer's case (Fig. 107) occurred in a German woman 36 years of age who had given birth to 2 children. The cyst resembled a cystocele, beginning on the anterior wall from below about ¼ in. back of the meatus urinarius, and extending up the vagina near the cervix, a distance of 3 in. It contained about 1½ oz. of fluid. Geyl believes that these cysts can undergo malignant changes. The treatment in all cases should be total extirpation. Turgard[1] reports 3 cases of hematic cyst, 2 vaginal and 1 vulval.

Murphy[2] reports a case of *fibroma of the vaginal wall* which was apparently attached to the wall of the urethra in the median line, and extended from that point to the left as far as the margin of the pelvis. Rectal examination showed that the tumor was about 1 in. from the cervix uteri. It was readily enucleated through a median incision in the anterior vaginal wall, and was then found to measure 9½ cm. in length and 5 cm. in diameter. It weighed 57 grams. [Kleinwächter has collected 53 cases of this growth; Breisky adds 5 more; Hasenbalg reports 1, and Donald 1 case. Of the total number, 29 were in the anterior wall, 12 in the posterior wall, 5 in the sides, and the others not stated. The tumor may reach a considerable size; it is

[1] Ann. de la Policlinic de Lille, Feb., 1896. [2] Jour. Am. Med. Assoc., Feb., 1896.

more frequently sessile than pedunculated; its growth is very slow; it may be observed at all ages, Martin reporting a case in a child at birth, but it is most common in middle age. The symptoms are mainly due to pressure upon the bladder, urethra, and rectum.]

R. Olshausen[1] states that *primary carcinoma of the vagina* usually begins in the posterior wall. Of 18 cases coming under his observation during the past 8 years, this held good in 13 cases. From this location the disease usually extends to the cervix. In cases of vaginal carcinoma not involving the cervix he begins the operation by splitting the perineum transversely, and then dissects the vaginal wall bluntly from the rectum. In this manner an opening into the peritoneum can easily be avoided. When the uterus is involved the operation is begun in the same manner, and, after the vaginal wall is dissected from the cervix, Douglas's cavity is entered, the uterus is retroverted through the opening, the broad ligaments tied off, and finally the bladder is dissected from the anterior wall of the uterus. It is too early as yet to speak of the permanent result. Vaginal carcinoma thus far does not offer a favorable prognosis, the recurrences occurring early. In 16 of the author's cases relapses occurred in 15; in the 16th case the disease had not recurred after 2 years.

Rehn[2] advocates vaginal resection of a carcinomatous rectum, a vertical incision being made in the median line of the posterior wall of the vagina, and carried backward in the perineum as far as the external sphincter ani. This permits of free removal of a large malignant growth, and facilitates the separation of the diseased mass from the surrounding soft spots. The rectum having been plugged with antiseptic gauze and the vagina thoroughly disinfected, the posterior vaginal wall is carefully incised and separated from the diseased gut. The perineum is next incised in the middle line, and the rectum below the seat of disease isolated, ligatured, and divided. The upper and cancerous portion of the gut is now drawn through the vaginal wound and excised. This stage of the operation, it is asserted, can be effected with but little hemorrhage and with free exposure of the diseased structures. An opening in the peritoneum can be readily dealt with in this operation, and any enlarged glands in the mesorectum can be removed without difficulty.

Patency of Gärtner's Duct.—A. J. C. Skene[3] records a singular case of patency of a Gärtner's duct in a young girl of 15 years, very large and well developed, but who had all her life been greatly annoyed by a constant watery discharge from the urethra, sufficient in quantity to keep her underclothing wet all day and saturating a protecting napkin at night. The discharge was not modified in quantity by the erect or recumbent posture, nor by the empty or distended condition of the bladder. The most careful examination of all the pelvic organs revealed nothing abnormal, excepting a slight ridge or fold of mucosa in the vagina on the right side anteriorly. This elevation or ridge ran from the upper third of the urethra upward to the

[1] Centralbl. f. Gynäk., No. 1, 1895.

[2] Med. Rec., Oct. 19, 1895.

[3] Ibid., May 16, 1896.

junction of the vagina and cervix uteri. The fluid contained a very few epithelial cells and a trace of albumin, but none of the constituents of urine. A close endoscopic examination finally revealed a minute orifice from which there issued a jet of clear fluid as fine as a hair. This opening was at the place where the small ridge in the vagina joined or disappeared in the wall of the urethra. The entrance of the duct into the urethra was closed by passing a ligature around that portion of the vaginal wall (close to the urethra) which was presumed to contain the duct. This was followed by an enlargement of the vaginal ridge, confirming the diagnosis of a patent Gärtner's duct. The ridge was then divided just above the ligature and a dram or two of clear fluid escaped, after which the entire ridge was cut away; in the portion thus removed was found the duct, which was very small at the lower part, but large enough at the upper part to admit a pocket-case probe. [This is the first case of patency of Gärtner's duct opening into the urethra that is recorded in medical literature. It is also an interesting proof that Gärtner's ducts are quite distinct from the ducts of the urethral glands.]

Hydrocele of the Labium Majus.—A prolongation of peritoneum may reach below the mons veneris through the inguinal ring, covering the round ligament. This peritoneal investment may become adherent about the ring, and a transudation of serum occur into the cavity thus formed. This condition is then known as hydrocele of the labium majus. According to Edwards,[1] it may be of several varieties: 1. That in which there exists a patulous canal of Nuck. The fluid in this variety is excreted from the peritoneal surfaces covering the ligament, and is free to return within the general peritoneal cavity. 2. The sac may be entirely cut off from the abdominal cavity and dropsy occur in this closed sac. 3. The cellular tissue of the labium majus consists of two layers, which are prolongations of the superficial abdominal fascia. These 2 layers are considered the analogue of the dartos tunic, and between them a serous tumor may form. This is considered by some to be true hydrocele in woman. 4. The substance of the round ligament itself may be the site of a cyst. The gubernaculum of Hunter in the fetus becomes the round ligament in the female. This fetal structure is at first hollow, and there may be a persistence of this fetal condition which allows the formation of a cyst. Eisenhart has collated 48 cases of hydrocele in the female, and finds that 29 were upon the right side and 19 upon the left; he considers traumatism and congenital defect to be the most frequent causes. Smith believes that the disease is not so rare as is stated; during a period of 4 years he says that 5 cases have been operated upon in the Tottenham Hospital. The treatment of hydrocele feminina is operative. The cyst should be exposed by a linear incision, the neck ligated, and the cyst enucleated. The wound is to be closed by superimposed layers, as in the closure of hernia. Simple puncture of the hydrocele is of little avail.

Hermaphroditism.—An instance of male hermaphroditism is reported by Rein.[2] The subject, aged 22, died of phosphorus-poisoning. Externally,

[1] So. Cal. Pract., Dec., 1895. [2] Nouv. Arch. d'Obstét. et de Gynécol., Oct. 25, 1895.

the body presented female characteristics: the face was smooth, the breasts and hips feminine; the vulva seemed quite normal; the clitoris was about 1½ in. long; and the urethral meatus opened between the folds of the frenum of the clitoris. The labia majora were flaccid, the nymphæ well formed. On the contrary, the internal organs were male. The testes were well developed and bore rudimentary epididymises. The prostate was small and contained vesicles full of fluid. The pelvis was funnel-shaped and quite masculine.

Atresia of the Vulva and Vagina.—Coromilas[1] reports 2 cases of congenital atresia of the hymen, in 1 of which there was a large accumulation of blood constituting a hematokolpos; 250 grams of dark blood were withdrawn after puncture of the tumor. Two similar cases are reported by Webster,[2] the first patient being a girl of 18 years. The hair of the mons veneris, instead of being arranged, as is normally the case in women, with the upper limit transverse, tailed up toward the navel as in males. There was no ostium vaginæ, the hymen being fleshy and imperforate. The rectovesical examination showed but a thin partition in place of the vagina. The uterus was somewhat enlarged and only slightly movable; extending outward from it on the left side was a swelling the size of a fetal head, immovable and apparently cystic. The case was diagnosed as one of atresia of the whole vagina, with retained menstrual blood in the tubes, chiefly in the left. Abdominal section was performed and the left tube (greatly distended) and ovary were removed. The patient died of septic peritonitis 6 weeks later. Postmortem examination showed that the vagina was normally developed in its upper three-fourths and atresic only in its lower fourth. The uterus was well formed, and this was the strongest indication that the vaginal atresia was not a complete one, because Breisky claims that usually entire atresia is found only in connection with atrophy of the uterus. The case is also interesting from the fact that although the patient's history pointed to menstrual retention for about 3 years, *there was no distention of the vagina or uterus.* Breisky says that in every deep-seated atresia the distended vagina forms a large part of the retention-tumor. One of the earliest symptoms of retention may be difficulty in urination or defecation, due to the pressure of the vaginal swelling.

The rarest variety of congenital narrowing of the vagina takes the form of a transverse septum, constituting a kind of second hymen. Only about 20 of such cases are on record. Five additional cases are reported by Stone,[3] 3 occurring in young women who had never borne children or suffered injury. Pregnancy existed in each case. In the first the septum was about 2 in. from the introitus, and contained an opening about ½ in. in diameter, which admitted the tip of the finger. The membrane was elastic and thin and showed no signs of inflammation. Menstruation had always been regular up to the time of pregnancy. The second was a duplicate of the first, excepting that a few bands extended from the cervix to the membranous septum. In the third the lumen of the vagina, about 2 in. from

[1] Ann. of Gyn. and Pæd., Jan., 1896. [2] Am. Jour. of Obst., Sept., 1895.
[3] Boston M. and S. Rep., May 30, 1895.

the introitus, was distinctly narrowed by a ridge of tissue. There was uterine displacement and some endocervicitis, but no history of injury or operation and no tendency to contraction. The 2 remaining cases occurred in patients seen by Dr. J. F. Scott. In 1 the septum was about $1\frac{3}{4}$ in. from the entrance to the vagina, and contained an orifice large enough to admit a uterine probe. During labor the septum resisted the advance of the head for several hours, or until it was slit in several directions. In the other menstruation had always been irregular, the intermissions being followed by a profuse flow of black and tarry blood, which lasted sometimes for 15 days and was accompanied by severe pain. The septum was $1\frac{1}{2}$ in. from the vaginal orifice, and contained an opening which admitted a uterine sound. It was very dense and tight, and fully $\frac{1}{8}$ in. in thickness. Stone thinks that this anomaly may be explained by the following theory: The fusion of the Wolffian ducts, which form the genital tract, takes place during the third month of fetal life, and begins about two-thirds of the way down the genital tract, extending both upward and downward. The septum may be the result of fusion beginning in two places, thus leaving a band that separates the upper and the lower part of the vagina. In the fourth month the genital tract becomes flattened and the epithelial surfaces meet and grow together, forming an epithelial lamina which rapidly proliferates; the floor and roof of the vaginal tract are thrown into folds; an external thickened portion dilates and forms the ampulla of the vagina, and internally a cup-shaped outgrowth embraces the lower end of the uterus. In the sixth month the lumen of the vagina is formed by degeneration of the mass of epithelial cells. According to Tourneux's section, there are several distinct foci of degeneration, and Stone thinks it possible that groups of cells between the foci retain their vitality, and thus form the transverse septum of the vagina.

A similar case of transverse vaginal septum is reported by Chapman[1] in a young girl of 17 years, the septum being $1\frac{1}{2}$ in. within the introitus. In congenital cases it is most usual to find a partial contraction, so that the vagina presents the appearance of a funnel with the narrow end pointing upward.

Acquired contractions are most commonly the result of puerperal lesions where loss of tissue has occurred, or of instrumental labor in which the soft parts have been injured. Occasionally they may result from traumatism, the long retention of foreign bodies, or the action of caustics. Local ulcerative processes, associated with acute specific diseases or otherwise, not infrequently cause vaginal stricture. Lipinsky[2] suggests the general rule that congenital strictures occupy the upper and acquired strictures the lower portion of the vagina. Remarkable instances of acquired constriction are recorded by Hirst[3] and Hamill.[4] To effect a permanent cure in these cases recourse must be had to some form of plastic operation involving partial or complete transplantation of mucosa or skin.

Anus Vulvovaginalis.—Cases of this exceedingly interesting condition

[1] Boston M. and S. Jour., Dec. 19, 1895.
[2] Ann. de Gynéc. et de Obstét., Apr., 1895.
[3] Am. Jour. of Obst., Dec., 1895.
[4] Ibid.

are reported by Dwight[1] and Freeman.[2] The vulvovaginal anus is a very rare condition, and especially in the adult. Almost all cases reported in literature are those of infants; hence Dwight's case is of special interest, occurring as it did in the body of a white woman 32 years of age, and apparently a virgin. There was no anus, but the rectum opened into the vulva just above the posterior commissure by an orifice that would admit a large finger. The vulva was otherwise quite normal, except that the hymen was poorly developed; it consisted of merely a slight fold above and at the sides; there were no caruncule myrtiformes. No depression or suggestion of the place of the normal anus was detected. The rectum was smaller than usual, and ran from the tip of the coccyx along the floor of the pelvis, continuing tubular to the last, without a well-marked dilatation. No sphincter could be detected at the termination of the rectum. The vagina was normal, and capacious above the entrance. The levator ani muscle was very strong. Freeman groups malformations of the rectum and anus into 4 principal kinds: 1. *Atresia ani*, in which the anus alone may be absent or the entire lower portion of the bowel as far as the upper border of the internal sphincter be obliterated. Sometimes a small fistulous opening remains, which is usually situated farther forward in the perineum than normal. A dimple often marks the spot where the anus should exist, and the fibers of the external sphincter may be present beneath the skin. 2. *Atresia ani et intestini recti*, in which the colon ends in a blind pouch at the level of the last lumbar vertebra or on the left side at the upper border of the sacrum. 3. *Atresia recti*, in which the rectum ends at some portion of its course without communicating with the anal portion of the bowel. The latter, however, is present, projecting upward from the anus like a short glove-finger. In rare cases the rectal pouch may open into the vagina. 4. *Cloaca congenita*, in which the rectal pouch, lying generally in the hollow of the sacrum, opens into some portion of the genital or urinary tract. The opening is often small, and may lead into the rectum through a narrow canal. In the male sex the opening may be into the lower portion of the bladder or into any part of the urethra, while in females it is often into the vagina, generally into the vulva near the posterior commissure (*vulvovaginal anus*). Very rarely the rectum communicates with the uterus. When the opening is in the upper part of the vagina the latter is often double, the feces passing through but one of the divisions. Between 60 and 100 cases of vulvovaginal anus have been reported. The opening is always in the posterior wall and generally low down near the posterior commissure. It may be small or large, and is usually so guarded by a sphincter muscle that fecal matter is perfectly retained, although incontinence sometimes exists. A normal anus may also be present, and the vulvovaginal opening may be closed by a membrane or by a valvular fold of mucosa, so that no fecal matter enters the vagina. Such a case was recently observed by Bernardy and Dorland in a woman over 40 years of age. In the normal condition of the bowels the feces were evacuated through the

[1] Am. Jour. Med. Sci., Apr., 1895. [2] Med. News, Sept. 21, 1895.

anus, but when diarrhea existed there was an escape of the fluid discharges through the vaginal orifice. As regards the cure of the condition, Freeman recommends the method of Rizzoli, which is as follows: A longitudinal incision is made in the perineum from near the tip of the coccyx almost to the posterior vulval commissure. A sound is inserted into the bowel through the vaginal anus to serve as a guide, and the perineal incision is gradually deepened until the rectum is reached. This is loosened in its entire circumference from the surrounding tissues, including the posterior vaginal wall, by blunt instruments. The end of the bowel is then cut out from the posterior vaginal wall with a pair of fine scissors, leaving an opening slightly larger than the original anus, which is at once closed by fine sutures. The entire bowel, including the vaginal anus, is then swung backward through the perineal incision to its normal position in front of the coccyx, and the edges of its orifice united by a number of silk sutures to the cut edges of the skin. A few deep stitches serve to unite the perineum in front, thus restoring the parts to the normal condition. The sutures are removed on the eighth day.

Perineorrhaphy.—In writing upon kolpoperineorrhaphy Garrigues[1] states that the deep tear of the vaginal ring (ostium vaginæ), implicating the levator ani muscle and its fasciæ, is usually found backward and outward in the direction of the tuberosity of the ischium, the reason of which is probably that the muscle is caught between this point and the head, while in the median line the intervening rectum and the double fascia that descends in front of it as a continuation of the pelvic fascia furnish a soft pad that protects the muscle. The break is much more common on the right than on the left side, which probably is due to the preponderance of the first position of the vertex presentation. The occiput escapes under the rami of the left pubes and ischium, while the broad forehead continues to press in the opposite direction on the posterior wall of the vagina. For this condition of broken vaginal ring with a more or less pronounced prolapse of the posterior wall of the vagina, whether combined with a tear of the vulvar ring (*rima pudendi*) or not, Garrigues considers kolpoperineorrhaphy as the best operation. The operation consists in the removal of a triangular piece of the mucosa of the posterior wall of the vagina and the vulva, in the folding in from side to side of the denuded surface, and in the elevation of the posterior wall toward the anterior (Figs. 108–110). The operation should be performed with almost mathematical exactitude, beginning by placing certain landmarks. A point is chosen on the mucosa of either labium majus, near the edge of the same, and at such a distance from the clitoris that after the operation an opening is left of suitable size for copu-

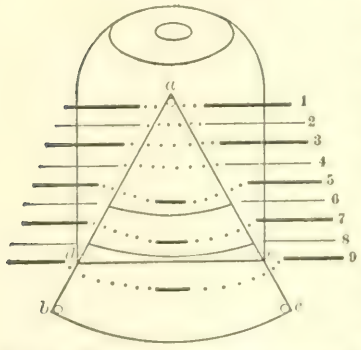


FIG. 108.—Denudation and vaginal sutures (Garrigues).

[1] Med. News, May 30, 1896.

lation. These two points (*b* and *c*) are marked by making a small nick with curved scissors in the mucosa. The labia majora are then pulled apart in a transverse direction, and the operator chooses a point in the median line of the posterior wall as high up toward the cervix as the prolapse goes (*a*),

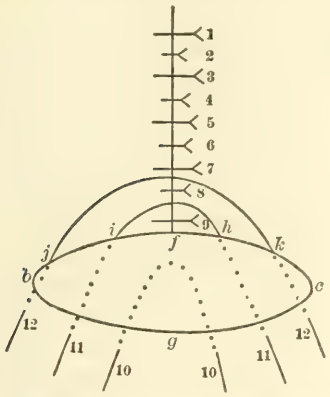


FIG. 109.—Vaginal sutures closed; perineal sutures inserted (Garrigues).

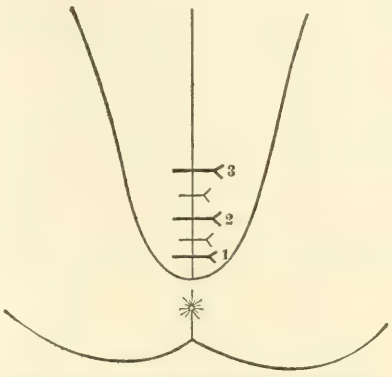


FIG. 110.—Perineal sutures tied (Garrigues).

seizes it with a bullet forceps with catch, pulls it forward and upward, putting the mucosa on the stretch, and leaves the forceps in the hands of the assistant to the left of the patient. Imaginary lines are then drawn from this point to the two nicks on the labia majora, and where these lines intersect the lateral furrow of the vagina (*d* and *e*) strong tissue forceps are inserted. A small hole is then cut in the mucosa just within the two lateral pairs of forceps, a pair of blunt scissors, curved on the flat, is introduced closed through the opening on the left side, with the concavity turned toward the operator, and pushed up to the median forceps, and then across to the other side and out through the opening there. This triangular flap is now cut loose on both sides, and the scissors is then entered through the opening on the left labium majus (*c*), and pushed up to the forceps in the lateral furrow (*e*), and down to the line of demarkation between the mucosa and the skin (*b c*), thus loosening the whole mucosa on this side. The scissors is then entered through the opening on the right side (*b*), and this half is loosened, and finally the whole piece is cut loose along the edge (*e c*, *c b*, *d e*). The second step in the operation consists in the insertion of sutures—No. 4 silk being used for the deep vaginal, braided No. 2 for the superficial vaginal, silkworm gut for the deep perineal, and fine catgut or silk for the superficial perineal. Large curved Hagedorn needles are very serviceable for all the sutures, which are inserted from side to side, beginning from the top of the triangle (*a*), alternating deep and superficial ones (1 to 9, dark lines, deep sutures; light lines, superficial), and leaving $\frac{1}{4}$ in. between two and two sutures. They are tied immediately and cut short. The superficial (2, 4, 6, 8) go only through the edges of the mucosa. The deep ones go in the upper part horizontally from side to side, and under the whole surface. When the

surface becomes too broad, the needle is brought out ¼ in. from the median line and inserted on the corresponding point on the other side. The sutures are also placed in a slanting direction (5, 7, 9), so that when tightened they lift the posterior wall up, having a resisting point behind where the lateral sulcus is yet fastened to the pelvic bones with fasciæ. Thus the stitches are inserted all the way down until the distance from the last suture to the landmark on the labia (Fig. 2, *fe*) is equal to that from the latter point to the median line, following the skin (*e g*). About 5 deep and 4 superficial sutures are needed. To form a perineum 3 sutures are inserted from the skin. The first (10) enters about ½ in. from the median line and ⅜ in. from the denuded surface, and is carried all under the surface about two-thirds of the distance up to the lower end of the closed line of sutures (*f*). The second (11) is inserted midway between the first and the third, and is brought out on the upper edge of the denuded surface, between the inner and middle third of its length (*h*), reinserted at the corresponding point of the opposite side (*i*), carried under the denuded surface and out on the skin. The third (12) is inserted outside of the outer end of the wound (*c*), carried under the denuded surface, brought out on the upper edge between the middle and outer third of its length (*k*), inserted at the corresponding point of the other side (*j*), carried under the denuded surface, and out through the skin outside of the right end of the wound (*b*). The direction given to the sutures ensures a very perfect adaptation of the edges and makes the surfaces brought in contact with one another sufficiently broad to form an excellent substitute for a perineal body. The patient is kept in bed for 2 or 3 weeks. The operation differs from Hegar's in the following points: (1) The blunt, deep denudation; (2) the slanting direction of the vaginal sutures, which lift the posterior wall up against the anterior; (3) the slanting direction of the perineal sutures, which ensures a more perfect adaptation of the edges.

CONDITIONS OF THE CERVIX UTERI.

Bacteriology of the Cervical Canal.—Stroganoff[1] has made a bacteriologic examination of the uterine cervical secretion in 31 women—11 pregnant and 20 nonpregnant. In 9 of the 11 women, 81%, the cervical canal was found sterile. The 2 remaining cases contained microorganisms, because of granular vaginitis in 1, and because a vaginal examination had been made the day before in the other. Of the 20 nonpregnant women, the cervical canal was sterile in 16—80%. The 4 remaining cases of this class he believes were infected through vaginal examination, made for 3 consecutive days for the bacteriologic examination. Cultures made the first day remained sterile; one of those made the second day contained a single colony; and of those made the third day half contained microorganisms. From his studies Stroganoff concludes that the uterine cervical canal of pregnant and nonpregnant women is, as a rule, sterile; that the area surrounding the external cervical os is the

[1] Centralbl. f. Gynäk., No. 38, 1895.

point of separation of the sterile and nonsterile female genital tract; and that the cervical mucosa destroys bacteria. He also believes that the menstrual and lochial discharges prevent infection of the uterus.

Tuberculosis.—J. D. Williams[1] reports 2 cases of tuberculous disease of the portio vaginalis. In the first case the patient was 63 years of age and the subject of pulmonary tuberculosis, from which she died a few weeks after being brought to the hospital. The genital organs, removed at the autopsy, showed a tuberculous affection of the cervix, involving a portion of the adjacent vagina. There was no tuberculous disease of the body of the uterus, nor of the appendages. In the second case the patient was 36 years of age. She showed some disease of both apices. On the cervix an irregular ulcer was to be seen, and this, on microscopic examination, proved to be of a tuberculous nature. [These cases are of interest from the location of the lesion, and because they bear out the observation made by others, that in cervical tuberculosis the body of the uterus and the appendages usually remain free of the disease.]

Congenital Erosion and Split of the Cervix Uteri.—Penrose[2] calls attention to this condition of the cervix uteri in virgin and sterile women, and which had previously been noted by Leopold in 1872 and Fischel in 1880. Fischel describes 2 distinct conditions—namely, a congenital erosion and a congenital split of the cervix, and the former is much the more frequent lesion, occurring to a greater or less degree in 36% of the infantile cervices which he examined. Penrose has had no opportunity of studying the cervices of infants, but he has met 1 undoubted case of congenital split of the cervix in a virgin, and 3 cases of disease of the cervix in young women which he thinks may be explained by the presence of the congenital erosion described by Fischel. A microscopic examination of the amputated cervix from one of these cases showed that it was covered with squamous epithelium except on the small patches of erosion on its vaginal aspect, where cylindric epithelium was present. Racemose glands (like the normal glands of the cervical canal) opened all over the face of the vaginal cervix, in front, behind, and to the sides of the external os. They were found as far as from $\frac{1}{2}$ to $\frac{3}{4}$ in. from the external os. These glands opened on the vaginal aspect of the cervix, where it was covered with squamous epithelium, and this epithelium extended to the ducts of the glands, which were lined with cylindric epithelium. The vaginal cervix was, in fact, a glandular structure. This congenital condition varies from that due to bilateral laceration with anteroposterior ectropion, in that the face of the cervix in the former condition is round, plane, or very slightly uniformly convex, and not oval, with its anteroposterior axis the longer, as in the traumatic condition. There is also no indication of any angle of laceration, macroscopically or microscopically; the cervix is mushroom-shaped, and the ectopion may be lateral as well as anteroposterior. It is probable, according to Penrose, that the condition is due to the development upon the vaginal aspect of the cervix of those structures that

[1] Brit. Med. Jour., May 4, 1895.

[2] Am. Jour. Med. Sci., May, 1896.

are normally confined to the cervical canal. The proper treatment for such cases is amputation of the cervix.

FISTULÆ.

Vesicovaginal Fistula.—[Fistulæ of the vagina are becoming exceedingly rare, and in consequence the literature is annually becoming scarcer.] Probably the most important contribution is that of Schauta[1] on adherent vesicovaginal fistulæ, those in which the proximal and mesial margin of the fistula is directly continuous with cicatricial tissue intimately adherent to the descending ramus of the pubes, which forms the lateral and distal margin of the fistula. In such cases he advises vertical incision, lateral to the left labium majus; dissection down to the descending ramus of the pubes, separation of cicatricial tissue, walls of the vagina, and fistula from the bone, by means of a periosteal elevator, as far as the obturator foramen. The margins of the fistula are now freely movable, and their coaptation thereby rendered more easy. Symphysiotomy, which has been recommended by Wickhoff and others in these cases, as a rule will not give good results, since only a slight separation can be effected on account of the resistance offered by the ligamentous attachments.

Rectovaginal Fistula.—Ségond[2] reports a case of rectovaginal fistula which is remarkable alike for the manner of its causation and the method by which it was cured. The patient was a strong, healthy woman of 31. When she was a girl of 15 she and a companion each conceived the singular idea of introducing a pomatum pot into the vagina. Her companion died in a short time with symptoms of peritonitis. The patient, after much suffering, established a toleration of the foreign body, and lived in hope of its being expelled spontaneously. At 19 years of age she married without saying anything about the state of things, and until April, 1894, there seem to have been no pathologic or matrimonial troubles. Then she came under treatment with symptoms of peritonitis, rigors, vomiting, and abdominal distention and tenderness. On vaginal examination the foreign body was discovered incarcerated in the posterior culdesac and in a rent which it had made in the rectovaginal septum. This was extracted on May 3d under chloroform with careful antiseptic measures. To remove the pot it was necessary to cut off a fleshy mass that projected into its interior. A large, high-seated, rectovaginal fistula now remained, and the passage of feces per vaginam was a source of annoyance. The edges of the fistula were hard. The upper margin was formed by the indurated and ulcerated posterior lip of the cervix, which was practically continuous with the rectal mucosa. The case was difficult to operate upon. The uterus resisted downward traction and the perineum was thick and firm. After considering the exceptional difficulties of treatment Ségond operated in the following novel way: He first dilated well the sphincter ani. He then resected the anterior part of the mucosa of the rectum as far as the sphincter extended, and then separated the whole thickness of the

[1] Monatsh. f. Geburtsh. u. Gynäk., Bd. i. No. 1, 1895. [2] Ann. de Gyn., July, 1895.

rectal wall as far as the fistula. At this point he carefully dissected the rectal mucosa from the uterus. The rectal wall was now freely separated anteriorly, but still adherent posteriorly. He was able, by further careful separation, to bring down the upper edge of the fistula and to suture it to the anus. Only so much of the rectal wall was removed as was necessary for the proper proportioning of the parts. Finally, the edges of the vaginal aperture were sutured together with catgut. The patient recovered exceedingly well, and a complete cure was obtained.

Auvard[1] reports the case of a woman, 33 years of age, who had on two previous occasions been confined without the assistance of a medical man. From the time of the second confinement the patient noticed that feces passed from the vagina when she had diarrhea. She was now in labor for the third time, and delivery took place normally, the infant being alive and weighing 3600 grams. A rectovaginal fistula, admitting the tip of the index finger, was found 3 cm. above the vulvovaginal orifice. Feces came entirely from the vagina, and therefore on the eighth day of the puerperium Auvard operated on the fistula, and with complete success. The case was noteworthy in several ways: The origin of the fistula was obscure, for the labor which it followed was easy and uncomplicated, and the operation was performed on the eighth day postpartum, nearly on the day after certain manifestations of septicemia, and yet with good results.

Ureterovaginal Fistula.—Vaginal fistulæ communicating with the ureters and developing as a sequel to vaginal hysterectomy have been reported by Kelly[2] and Richelot.[3] Richelot says that they appear a week or 10 days after the hysterectomy at the time of the separation of the eschars. They are generally supposed to be due to wounds of the ureter, but he believes it more probable that they are the result of damage to the base of the bladder. Recent discussion by French surgeons developed the fact that in vaginal hysterectomy the right ureter is more frequently injured than the left. An explanation of the manner in which this accident happens is given by Fournel,[4] who believes that the right forefinger can, with little difficulty, thoroughly separate the tissue on the left side of the cervix, while the uterus is drawn down by the left hand holding the volsella, but it cannot so easily separate the cervix from the structures on the opposite side. The left hand, when grasping the volsella firmly so as to draw the uterus well down, tends to be supinated, and in that position it draws the uterus easily toward the right side of the patient; hence it becomes a simple matter to separate the tissues to the left of the cervix, working with the right forefinger, since the left hand does not readily become fatigued. To let the right forefinger work in the right side of the uterus the left hand has to be pronated, depressed toward the patient's perineum, and swung to the patient's left side; under these unfavorable conditions it is not possible to do such careful clearing away of structures, and the right

[1] Arch. de Tocol. et de Gynéc., Sept., 1895.

[2] Bull. of Johns Hopkins Hosp., vol. vi. No. 7.

[3] Gaz. méd. de Paris, Apr. 20, 1895.

[4] Gaz. des Hôp., Apr. 23, 1895.

ureter is consequently in danger when the ligatures are applied. To avoid this accident it would be well to allow a trusty assistant to hold the volsella while the operator cleans the cervix on the right side with his own right forefinger. In Kelly's case the carcinomatous degeneration of the cervix uteri invaded the surrounding tissues for a considerable distance; the ligatures were consequently placed at a greater distance than usual from the cervix uteri, and in placing them on the right side the ureter of that side was occluded. Operation for the relief of this condition was undertaken 7 weeks after the removal of the uterus. The end of the ureter could not be found on the pelvic floor, on account of the rigidity and inflammation surrounding the line of scar-tissue between the rectum and bladder. Failing to locate the ureter at this point, abdominal section was performed, when it was sought and readily found at the pelvic brim after lifting up the caput coli and incising the peritoneum and pushing aside the fat. It was then traced from the point of crossing the common iliac artery down to the pelvic floor, exposing the whole length of the pelvic portion by splitting the peritoneum over its surface. The anterior part of the ureter was involved in the inflammatory material surrounding the scar, which bled so freely that an attempt to dissect it out had to be abandoned. Finally 4 c.cm. of the tube lying directly posterior to the scar-tissue were separated from the inflammatory bed and divided close to the scar, so as to sacrifice as little of it as possible. It was found, however, that there was not enough of the tube available for union with the bladder except by making too much traction, and in order to avoid this, as the stitches would not hold under traction, the bladder was dissected free from its attachment to the horizontal rami of the pubis and allowed to drop back into the pelvis. In this manner the ureter and bladder were approximated without strain, and a small incision was made through the peritoneal coat of the bladder just large enough to receive the ureter snugly. The under surface of the ureter was then trimmed, and the union to the bladder effected by holding the ureter temporarily by a long pair of forceps introduced through the urethra, the bladder, and the incision, while 6 silk sutures were introduced through the muscular tissue of the bladder and the peritoneal and muscular coats of the ureter, beginning with the under side. The union was perfect, and a provisional gauze drain was removed from the abdomen, and the abdominal wall closed entirely after the second day. At a subsequent cystoscopic examination the newly-made ureteral orifice was found opening into the posterior hemisphere of the bladder, into which it freely discharged its urine. [There are on record 4 other cases in which during an operation the ureter was torn, and in which the ureter was reunited to the bladder: the operations were performed respectively by Novaro,[1] Penrose,[2] Krug,[3] and Baldy.[4] There are 2 others upon whom a urethro-ureteral anastomosis has been performed—Kelly[5] and Bache Emmet.[6] All of these operations were successful.]

[1] Centralbl. f. Chir., No. 27, 1893.
[2] Med. News, Apr. 28, 1894.
[3] Am. Gynæc. and Obst. J., Nov., 1894.
[4] Am. Jour. Obst., vol. xxxiii. No. 3, 1896.
[5] Ann. of Surg., June, 1894.
[6] Am. Jour. Obst., Apr., 1895.

Bumm of Bâsle[1] reports a case of ureteral fistula occurring in a woman, 30 years of age, during an instrumental delivery. Upon the introduction of the second blade the patient felt severe pain in the right side. Several days thereafter a hard mass was felt on the same side, which, as soon as the urine was passed, disappeared. There was no fever; examination disclosed a fistula of the right ureter. On account of the refusal of the patient to undergo any dangerous operation, the fistula was closed successfully through the vagina, in spite of its unfavorable position. After 8 weeks' preparation with hot injections, tampons, and daily massage, it became possible to gain access to the fistula situated in a mass of hard tissue. An attempted closure with thread-sutures caused stoppage of the flow of urine with its attendant symptoms. At first it was possible only to form an artificial vesicovaginal fistula in the neighborhood of the ureteral fistula; later the edge of the bladder was sewed to the edges of the ureteral fistula. At a third operation the vesical fistula was entirely closed. The patient was cured without any subsequent bladder-symptoms. The author recommends this method—which produced so excellent a result in an apparently very unfavorable case—for those ureterovaginal fistulæ especially that are situated high up in the vagina and are complicated by the presence of much scar-tissue in their neighborhood.

Ureteroabdominal Fistula.—Polak[2] reports an interesting case of ureteroabdominal fistula occurring in a woman upon whom an operation had been performed for multilocular ovarian cystoma. During the removal of the cyst the vesicouterine fold was torn, causing troublesome hemorrhage, which was controlled by a continuous fine silk suture. Convalescence was interrupted by a diminution in the secretion of urine during the first 96 hours, probably due to the combined action of the ether and acute digitalis-poisoning, as, through the mistake of the nurse, the patient received 62 minims of the fluid extract in 81 hours. Up to the tenth day the temperature did not rise above 100.2° F. In the next 2 days it reached as high as 103° F. Examination showed a right inguinal swelling and fluctuation. A pint of stinking pus was evacuated through an incision along the outer border of the right rectus muscle, and the cavity drained. The temperature promptly fell. It was noticed that the fluid drained from this cavity had a urinous odor, and that the quantity of urine excreted by the bladder was diminished. The existence of a ureteroabdominal fistula was demonstrated by the injection of methylene-blue and direct exploration of the right ureter. There was spontaneous closure of the ureteral fistula in 6 weeks. The patient menstruates regularly through the abdominal fistula.

URINARY ORGANS.

The Urethra.—*Stricture of the Female Urethra.*—Fischler[3] reviews the literature of this subject, and reports 4 cases occurring in 4000 dispensary patients. All 4 appeared complaining of the symptoms of vesical catarrh.

[1] Centralbl. f. Gynäk., No. 31, 1895. [2] Am. Med.-Surg. Bull., Nov. 15, 1895.
[3] Centralbl. f. Gynäk., No. 39, 1895.

Fischler believes that urethral stricture in women usually results from injury during labor or from an external traumatism. It has been observed that it may result from tumors of the urethra, as polypi, vascular and fibroid tumors, phlebectasis, carcinoma, and lupus. It is also possible that gonorrhea may be a cause, 9 cases with such an origin being reported by Herman. Fischler, however, agrees with Kleinwächter that since gonorrhea of the urethra is so very infrequently seen in every dispensary practice, and stricture so very rarely, it is scarcely to be included as a cause. Herman describes 8 cases and Kleinwächter 1 case as *senile stricture*, the patients being between 53 and 70 years of age. Herman thought that in these cases it was the result of a general fibroid thickening or induration of the urethra.

Anomalies of the Urethra.—Péan[1] reports a unique case of incontinence of urine in a young girl of 15, dependent upon the presence of a supernumerary urethra and bladder, the latter communicating with the normal bladder. As there was no sphincter at the opening of the supernumerary urethra, the incontinence could be readily explained. The removal of the additional bladder, and bringing together of the normal bladder-wall over the opening, were followed by complete relief. W. A. Edwards[2] records an anomalous condition in a nulliparous woman, 80 years of age. The opening of the urethra was at a distance of 6½ cm. from the clitoris, and situated in the median line of the anterior vaginal wall, entirely within the vulvar aperture. It was a vertical slit analogous to the male urethral opening, and was not puckered or rounded. The canal was 2½ cm. in length, and apparently traversed the bladder-wall before opening into the viscus, not unlike the course of a ureter. Careful search failed to reveal a urethra normally situated; the vestibule was smooth. [Such a case might readily result disastrously in the performance of a vaginal hysterectomy or other vaginal operation, and the possibility of urethral and ureteral anomalies should be borne in mind in all operations upon the pelvic viscera.]

The Bladder.—*Cystitis and Irritable Bladder.*—Dacheux[3] affirms that the condition of irritable bladder in women, which has previously been regarded as a purely functional derangement, is really, as Zuckerkandl states, due to a localized hyperemia of the mucosa, which can be demonstrated by the endoscope. Hyperemic patches are seen at the *bas fond*, and less often at the beginning of the urethra, which bear a close relation to concomitant congestion of the uterus and adnexa, and often disappear when the latter is relieved. In obstinate cases cystotomy is advised. Baldy's[4] experience teaches more and more that a large percentage of female patients suffering with subacute vesical symptoms, such as painful micturition, bearing-down sensations, and a feeling that the bladder is not emptied after micturition, can be readily relieved by dilatation of the urethra. The greatest amount of practical good that has been obtained in bladder-troubles by the use of the cystoscope may be attributed to the dilatation necessary to the introduction of the instrument. From

[1] Canad. Pract., Mar., 1896.
[2] Am. Gynæc. and Obst. Jour., Apr., 1895.
[3] Centralbl. f. Gynäk., No. 40, 1895.
[4] Phila. Polyclinic, 1895, No. 18, p. 100.

a series of cystoscopic examinations upon women suffering from pelvic diseases Kolischer[1] of Vienna has found changes to be present in nearly all cases. In cases of tumors the side of the bladder next to the tumor shows general edematous thickening. Pelvic exudate, on the other hand, produces not only local edema, but also produces a marked proliferation of the epithelium of the mucosa nearest the exudate. In young subjects troubled with incontinence there is usually found an inflammatory zone about the neck of the bladder. If this be cauterized a few times with silver nitrate, the condition will soon be cured. Cauterization of the bladder is not a painful procedure. Leder[2] reports a case of frequent micturition due to a partial retention of urine in a woman 51 years of age, which was cured by vesical massage. Ten treatments effected the cure.

Edema of the Bladder.—Kolischer[3] describes a peculiar form of edema of the vesical mucosa observed through the cystoscope. It appears in the form of circumscribed blisters the size of a pea, the rest of the membrane being normal. In some cases the blebs are so large as to resemble vesicular moles. The symptoms in this condition are painful urination, tenesmus, and a feeling of weight and pressure over the bladder. This "bullous edema" is regularly observed in connection with pelvic exudates adjacent to the bladder, especially when a pyosalpinx is adherent to that viscus. In cases of pelvic abscess in which this appearance was noted the edema and vesical symptoms disappeared after the pus was evacuated. When a solid exudate was slowly absorbed the disappearance of the edema was correspondingly tardy. It might readily be mistaken for malignant disease from the symptoms as well as from the thickening of the bladder-wall noted on palpation, but it is to be regarded as essentially of inflammatory origin. As regards local treatment, irrigation of the bladder seems only to increase the patient's sufferings. The trouble being secondary to inflammatory conditions outside of the viscus, the latter must be cured before the vesical symptoms are relieved.

Cystoscopic Examination of the Bladder.—Reynolds[4] emphasizes the importance of obtaining complete dilatation of the bladder in exploring that viscus with the cystoscope. He claims that no diagnosis can be considered satisfactory unless it be made by the inspection of a fully-dilated bladder; also, that a *negative* result derived from anything but complete dilatation is absolutely worthless. Three factors enter into the difference of results: First, and least important, in the partially dilated bladder the speculum is necessarily so near to the wall which is under examination that but a small field can be seen at any one time, and a systematic inspection of every part of the bladder is almost impossible from the loss of time involved; whereas when the bladder is dilated to its full capacity by holding the inner end of the speculum but a little inside the internal orifice of the urethra, the bladder-wall is at a considerable distance from the end of the speculum, and a large field can be covered by very slight motions of the speculum and in a short space of time. Secondly,

[1] La Sem. méd., 1895, No. 31, p. 267.
[2] Arch. de Tocol. et de Gynéc., No. 9, 1895.
[3] Centralbl. f. Gynäk., 1895, No. 27.
[4] Boston M. and S. Jour., Jan. 30, 1896.

and more important, in the partially dilated bladder there are necessarily numerous folds in which small lesions may be concealed, and, moreover, inspection of the all-important trigonal region is always rendered difficult, and sometimes impossible, by the presence of even a small quantity of urine; and it must be remembered that even if the bladder be wholly emptied at the start, the urine rapidly reaccumulates during the examination. Thirdly, and most essential, the appearance of the mucosa during partial dilatation is wholly different from its appearance when the bladder is in complete expansion. While the bladder-wall is lax, as must always be the case with partial dilatation, the mucosa has a soft, velvety-looking surface, which is rendered rough by the presence of innumerable minute wrinkles; that is, the surface looks granular; it is uniformly pink in color; granular inflammatory patches are almost indistinguishable from the surrounding healthy mucosa, and even shallow ulcerations are distinguished with the greatest difficulty. In contrast to this, in the presence of full dilatation—that is, when the bladder-walls are rendered tense by their intrinsic resistance to the expansile force of a fully-developed negative intraabdominal pressure—the normal mucosa shows a white and glistening field, over which branching blood-vessels throw a coarse network of brilliant red, and against which the smallest ulcer or inflammatory spot exhibits itself with almost startling distinctness. All folds are obliterated, and the all-important trigonal region is easily found. It seems to be a rule that if the region of the trigonum and its neighborhoods on the posterior and lateral walls are free from disease, there is every probability that the bladder as a whole is normal.

For obtaining dilatation of the bladder there is a choice of three positions: first, the position with the patient upon her back, her hips elevated by a pillow, the thighs flexed to the sides of the abdomen, and the knees extended across the chest; second, the knee-chest position; and, third, the Sims posture. The first position is rather uncomfortable for the patient, but is far more comfortable than the knee-chest posture. It renders the region of the trigonum more easily accessible than any other. It is consequently more convenient for both diagnosis and treatment, and more especially for the use of the ureteral catheter. Its disadvantages are that complete dilatation is less easily attained in this position than in either of the others, that the urine is less completely out of the way, and that a small amount makes more trouble. Kelly claims that it is better to use the knee-chest position until the patient have become well trained, and always in unfavorable cases. The knee-chest position is the most generally useful. Its great advantage is its creation of a more powerful negative abdominal pressure than can be obtained in any other, and, therefore, in the attainment of better dilatation than by any other position. The urine gravitates to the body and is wholly out of the way, so that a comparatively large amount makes no trouble. Its disadvantages are that any long maintenance of it is uncomfortable to the patient, and that the trigonal region is rather difficult of access. Sims's position is only occasionally useful. It is the most comfortable for the patient. Distention is more easily obtained than

in the dorsal position, but less easily than by the knee-chest position. It produces, however, a lateral dislocation of the bladder which is confusing to the surgeon, and makes the lower side of the trigonum and lower lateral wall somewhat inaccessible.

Contracted Bladder.—This troublesome condition, which was considered incurable until the valuable investigations of Matthews Duncan proved the contrary, was encountered by Mayo Robson[1] in a single woman, 35 years of age, who was admitted to the Leeds General Infirmary. The patient stated that her symptoms started 12 years previously, when she had great pain in the loin and at the neck of the bladder; at the same time she had to pass water very frequently, the pain and frequency of micturition having since persisted. She had occasionally passed small fragments of stone, the largest about the size of a coffee-bean. For 7 years she had had nocturnal incontinence of urine, and for 2 years complete incontinence both day and night. During the latter part of the time she had been comparatively free from pain. The urine was horribly offensive, alkaline, and loaded with pus. The patient was etherized and the pelvis examined bimanually in order to ascertain the size of the bladder, as the passage of the sound gave very little information, since immediately on entering the bladder it was arrested by coming in contact with hard calcareous material. Bimanual examination revealed the fact that there was practically no bladder, it being merely represented by a small hard lump about the size of a walnut. The ureters were apparently free from disease and there was no enlargement of the kidney. The urethra was dilated by a Weiss's dilator so as to admit the little finger, when it was found that the minute cavity was lined by phosphatic concretions, which were thoroughly scraped away by a Volkmann's spoon, the bladder then having a capacity of only $\frac{1}{2}$ oz., and, although the patient was under an anesthetic, no more could be injected by any reasonable amount of force. The incontinence persisted after the operation, and the bladder was washed out daily with boracic lotion, on each occasion the urethra being compressed around the nozzle of the syringe and moderate force being used in order to increase the capacity of the organ. After a few days the incontinence ceased, and the patient was told to hold her urine as long as possible. One week later she could hold it for half an hour. Twelve days later, as the patient had made no further progress, ether was given and the bladder distended with boracic lotion, when it was found that the capacity had increased to 2 oz. In 6 days considerable improvement had taken place, as she was able to retain her urine for 3 hours with some effort, and the quantity retained was 4 oz. Nine days later she held her urine for 4 hours. The bladder was again somewhat forcibly distended, but without an anesthetic; the capacity, however, could not be increased beyond 4 oz., and the next day the patient had pain in the hypogastrium with vomiting and considerable irritability of the bladder. This decidedly retarded progress, and, although in 3 weeks' time the capacity of the bladder was found to be still 4 ounces, there was very frequent micturition

[1] Ann. of Gyn. and Pæd., Feb., 1896.

and a slight elevation of temperature. Further dilatation was therefore not attempted, as it was thought that, the bladder having now some capacity, voluntary retention of urine would secure gradual dilatation, and this proved to be the case, for in 2 weeks' time she was able to retain 7 oz. of urine. Up to this time the patient had been kept in the recumbent posture, as it was found that she could thus hold the urine much better. In 2 more weeks her general condition was very much better than it had been for years, and the voluntary power of retention was good. In another fortnight she was able to hold 7 oz. of urine even when up and about, and she had not to micturate for 5 hours; and 10 days later she was discharged; she could hold 8 oz. of urine without discomfort and her general health was good and the urine normal. [This is practically the method of treatment as recommended by Duncan.]

Urinary Analysis.—[The value of a close observation of the condition of the urine in gynecologic cases is now much more generally appreciated than was formerly the case. Not only is this true of postoperative cases, but of nonoperative cases as well.] Probably the most important papers of the year on this subject are those of Etheridge[1] and Bloom.[2] Etheridge remarks that if the solids are excreted in sufficient quantity a normal condition exists. If they fall short of it, say 20%, an insufficient quantity is excreted and a true renal insufficiency exists. The amount of solids voided by healthy human beings may be assumed to vary from 500 to 1100 gr. daily, according to body-weight. Thus, a woman weighing 90 lb. ought to pass 500 gr., and a woman weighing 180 lb. ought to excrete 1100 gr. of urinary solids. With this knowledge to work from it is an easy matter to estimate the amount of solids that women of intermediate weights should void. Various working formulas exist for estimating solids; that recommended by Etheridge is known as Haines's modification of Haeser's method. Its simplicity and speedy solution relieve it of all the objections belonging to formulæ relating exclusively to estimating urea. It is this: Multiply the last two figures of the specific gravity of the urine by the number of ounces voided in 24 hours, and the product by $1\frac{1}{10}$. Thus, if the amount of urine voided in 24 hours be 36 oz. and its specific gravity be 1021, the formula would read 36 times 21 times $1\frac{1}{10}$ equals 831, the number of grains of solids contained therein, including urea and all the other solids. Etheridge has had an expert physiologist construct the following table, showing the amount in grains of normal excretion of urinary solids of human beings weighing from 90 to 180 lb.:

Weight.	Urinary solids.	Weight.	Urinary solids.
40 lb.	392 gr.	130 lb.	1028 gr.
50 "	479 "	140 "	1078 "
60 "	563 "	150 "	1150 "
70 "	639 "	160 "	1198 "
80 "	716 "	170 "	1237 "
90 "	789 "	180 "	1260 "
100 "	854 "	190 "	1300 "
110 "	916 "	200 "	1330 "
120 "	974 "		

[1] Chicago Med. Recorder, July, 1895.

[2] Univ. Med. Mag., Dec., 1895.

Women passing only 50% of the normal amount of urinary solids are extremely numerous. Women passing not to exceed 400 gr. of solids daily present varying degrees of nervous irritability. When the amount is lessened to 300 gr. or less daily, the condition of nervousness becomes a very serious semeiologic factor. Let a patient passing this amount of solids take a severe cold and she will develop a bronchitis, or a severe neuralgia, or a fresh attack of perimetritis, or a pleurisy, or some other malady equally grave. When the solids are diminished to 200 gr. in 24 hours the nervous system becomes very seriously invaded; and with the amount still further diminished, say to 100 gr. per diem, the patient will be found dangerously near the verge of uremic convulsions, the condition not infrequently found in the last weeks of gestation. Bloom emphasizes the importance of urinary analysis in gynecology, and gives the statistics of 1000 cases, largely taken from the records of the Gynecean Hospital in the service of Drs. Baldy and Penrose. In 11%, or 110 instances, albumin was found. The urine was acid in 75% of the cases. The specific gravity averaged between 1025 and 1030. In 25% the albuminous urine contained casts, the forms predominating being the granular and hyaline. In 75% of the remaining analyses in which albumin was present the albumin depended upon the presence of pus, associated with cystitis. In 1 case hyaline casts were found, but the urine was not albuminous. In 1% of the cases sugar was found; lithuria, oxaluria, phosphaturia, and indicanuria were frequently noted.

The Kidneys.—The Diagnosis of Ureteral and Renal Disease.—In some remarks on some of Pawlik's methods of investigation that he has been engaged in developing during the past year, Kelly[1] considers the following three methods of diagnosis: 1. Inspection; 2. Catheterization of the ureter; 3. Catheterization of the pelvis of the kidney.

1. *Inspection.*—In the ordinary examination without incision inspection is limited to the ureteral orifices in the bladder. The method adopted is the following: The patient is asked to urinate. She is then placed in the knee-chest position and a 10% cocain solution is applied to and within the external urethral orifice for 5 minutes. The urethra is dilated, when necessary, with a single conical dilator, up to 9 or 10 mm. in diameter. A simple cylindric vesical speculum, provided with an obturator, is next introduced into the bladder and the obturator withdrawn, when the bladder at once balloons with air. The examiner, with a head-mirror on his forehead, now reflects into the bladder a light (preferably electric) held as near the sacrum as possible. By turning the speculum 30° to the right or left and dropping the handle the ureteral orifice comes into view. The inspection is limited to this area, and three points are to be noted: (*a*) The appearance of the orifice and its surroundings. In inflammatory disease of the ureter or kidney this is often red, edematous, puffed out, mammillated, or even slightly ulcerated. In tuberculous disease descending from the kidney the author has seen the infection thickly strewn over a triangular area, the apex of which was at the orifice. (*b*) The charac-

[1] Internat. Jour. of Surg., June, 1895.

ter of the fluid seen issuing from the orifice will often settle the diagnosis and determine the plan of treatment. In cases of hematuria, pyoureter, and pyelonephritis there is no difficulty in locating the affected side, and seeing by the clear urine issuing from the other side that it is sound. When no discharge takes place it may sometimes be started by making bimanual pressure upon the renal tumor. (c) Normally, the urine flows in intermittent jets of a clear, limpid fluid. If one side discharges in this way and nothing comes from the other, there must be some obstructive disease. Pus-accumulations, when they escape, are likely to flow in a continuous sluggish stream. Attention is called to the fact that it is possible to catch the urine, as it escapes, directly in the speculum, and take it up for microscopic, chemic, and bacteriologic examination without passing a catheter into the ureter.

2. *Catheterization of the Ureter.*—In carrying out this procedure strict attention must be paid to antiseptic details. The method is as follows: An antiseptic speculum is employed. The ureteral orifice is cleansed with a pledget of cotton held in mouse-tooth forceps. A sterile catheter, not contaminated by handling nor soiled during the introduction, is passed into the ureteral orifice. The sterile outer end (protected up to this time with a piece of rubber tubing) is placed in a test-tube to collect, without contamination, the urine as it flows from the ureter. Kelly uses three varieties of catheters. That which he prefers is a flexible silk catheter, 30 cm. long and 2 mm. in diameter, with a blunt conical end and a large oval eye 2 cm. back of the extremity. In introducing the catheter it is engaged in the orifice of the ureter and pushed in for a distance of 12 or 15 cm. It may be left there as long as desirable. He also uses a simple, straight metallic catheter, which, however, is more liable to bruise the ureter, and a short metallic catheter, which is introduced entirely within the bladder and ureter and discharges through a fine rubber tube. Both ureters may be drained easily at one time with the flexible catheters. By noting the time the catheter is put in place and removed the rate of flow may be determined, and by the examination of the urine the relative value of the two kidneys is determined.

3. *Catheterization of the Kidney.*—For this the author has had made renal catheters 50 cm. long and $1\frac{3}{4}$ to $2\frac{1}{2}$ mm. in diameter, which are kept sterilized in glass tubing, and when introduced are simply drawn out of the tubing as they are pushed into the ureter. In this way he has drawn pus from the kidney, evacuating a large renal abscess, and by irrigating the abscess-cavity he has relieved a pyonephrosis.

As regards the diagnosis of *renal calculus* in women, Kelly[1] says that the presence of pus in the urine is one of the most characteristic signs of calculus in the pelvis of the kidney, but from the mixed urine in the bladder it is impossible to say from which side the pus comes; or if pain and swelling point distinctly to one side, it cannot be asserted, after any ordinary examination, that the other side is not affected too. To overcome this difficulty he passes the renal catheter as far as it can go. Usually 13 to 17 cm. of the

[1] Med. News, No. 1194, p. 593.

catheter are left projecting from the ureter. An airtight syringe with a tapering point is then connected by means of a fine rubber tubing with the end of the catheter, and separate suction is exercised. If pus be present, it is brought down at once into the syringe, and begins to flow long before it would naturally without suction. Suction is continued until the renal pelvis be emptied, and the fluid obtained is placed in a conical graduate for examination. In 3 cases he has been able to diagnosticate the presence of renal calculi by discovering in this fluid a minute dark-brown or black sediment consisting of small pieces of material about $\frac{1}{2}$ mm. or less in diameter. Under the microscope these were found to be composed of uric acid. Their appearance on the surface was mammillated, looking like an aggregation of little masses of rounded stone. On pressing them with a needle-point they were found to be quite coherent, each separate particle bending and breaking under pressure. In another case a small piece of stone was caught in the eye of the catheter and scratches were found on its end. Kelly has also devised a hard-rubber renal bougie, 2 mm. in diameter, with an olive point 3×2 mm., notched on two sides, the notch running lengthwise; some dental wax is melted, so as to coat the end of the bougie, giving it a smooth, glossy, impressionable point, which is not altered by any kind of contact with the soft tissues, but is easily scratched by the stone. By the foregoing methods the following points are claimed: 1. By renal catheters to demonstrate a unilateral or a bilateral pyelitis and the grade of each. 2. By suction at the outer end of the catheter to bring down bits of stone for microscopic and microchemic examination. 3. The color of these pieces of stone will denote the length of retention in the pelvis of the kidney. 4. The bruised end of the catheter is macroscopic evidence of violent contact with a hard body. [It is well to bear in mind that it is only in picked cases that the catheter can be passed into the pelvis of the kidney, and when it does succeed in passing the amount of good thus far accomplished has been practically *nil*. It is not difficult to imagine the amount of harm that might result from indiscreet and persistent efforts in this direction. One case of pyonephrosis was reported cured by the treatment, but it is our impression that at a subsequent time it was found necessary to remove the kidney.]

MENSTRUATION AND ITS DISORDERS.

The Period of Puberty.—[There has been noted within recent years a marked tendency to a more systematic supervision of the age of puberty in girls in an effort to overcome the proclivity to the development of sexual disorders that is characteristic of this critical period of their lives.] In the line of this evolution mention must be made of the paper of Playfair [1] upon the education and training of girls of the easy classes at and about this period. He insists that there should especially be borne in mind the highly sensitive nervous organization of the human female, the development of the emotional element that distinguishes the woman from the man and influences the cha-

[1] Brit. Med. Jour., Dec. 7, 1895.

racter and progress of all kinds of disease in women, but much more especially the diseases of the reproductive organs. He urges that the attention given to exercise and athletics in girls' schools is not nearly sufficient. It would not be difficult to make games compulsory, as they are in public schools for boys, and there are some that are admirably adapted for women, as, for example, golf, or rowing when it is feasible, or it may be bicycling. Each of these pastimes exercises the muscles generally, without those spasmodic efforts required in cricket, football, or even lawn tennis, which are, perhaps, too violent for girls. One other regulation in girls' schools he would like to see made compulsory, and that is that no form of corset should be worn.

[The subject of *bicycling for women* is beginning to attract the attention of medical writers.] Hogg[1] gives the opinions of a number of French, English, Belgian, Spanish, Holland, and Swiss gynecologists as to whether bicycling is beneficial or not to the health of women. The greater number agree, as Auvard, Chaput, Doléris, Treub, and Vulliet, that, as a rule, where it is not carried to excess, in women with healthy genitalia it is a profitable exercise; while a few others, among them Tait, condemn bicycling for women. The harmful influences which this exercise has are dependent upon its being overdone, the general health suffering, or upon faulty position and imperfect construction of the saddle, local diseases being produced. Women who have chronic inflammatory disease of the genital organs should not be allowed to ride a bicycle, since it causes hyperemia of these parts and thus accelerates the disease. A large number of French and other gynecologists believe that bicycling is a healing factor in disturbances of nutrition, as neurasthenia, hysteria, chlorosis, dyspepsia, and the like; also in chronic constipation, anemic amenorrhea, and nervous dysmenorrhea.

Townsend and Chadwick[2] have instituted a similar investigation among a number of female physicians of Boston. All but one stated decidedly that they considered bicycling of value to the average woman, some giving the qualifications that the wheel should be used in moderation, both as to length of ride and speed, and that the proper dress and posture should be observed. In uterine disease the majority limited the exercise to chronic cases, especially when the circulation was sluggish and the muscular system relaxed; cases of uterine neurasthenia, dysmenorrhea, amenorrhea, chlorosis, moderate displacements, and imperfect development are especially suitable for this form of out-of-door exercise. These favorable criticisms were not obtained from bicycling enthusiasts, as only 1 of the physicians consulted had used a bicycle herself.

Chadwick states that as yet no effort has been made to adapt the saddle to a woman's anatomy. The bicycle saddle for men seems to have been modelled upon the saddle that was found suitable for men riding upon a horse, being merely reduced in most of its dimensions. This has answered most of the requirements, though it has often been found to strike against the prostate gland or the pubic arch. When women began to ride they were given the same saddle, regardless of the fact that behind the pubic bones are the external genital

[1] Province méd., No. 38, 1894. [2] Boston M. and S. Jour., cxxxii. No. 24, 1895.

organs, so prominent as inevitably to rest upon the anterior projection of the saddle. The result has been that women have generally had great difficulty in having the saddle so adjusted as to be rendered comfortable; in other words, to avoid pressing unduly upon the vulva. To overcome this difficulty several alterations become necessary. In the first place, a woman's pelvis is broader than a man's, and the tuberosities of the ischia are farther apart in woman than in man; consequently, the width of the rear portion of the seat needs to be greater. Secondly, the anterior projection of the saddle must be tilted downward so that it will not strike against the vulva. This, however, requires the most delicate adjustment, for if the saddle is tilted too far the slope of the seat causes the rider to slide forward, so as to rest almost entirely upon the anterior projection, and so defeat the object of the tilting. Again, the seat may be shifted backward and forward upon the frame without tilting. When shifted backward the action of the leg upon the treadle tends to push the body backward, and thus to ensure that the ischia shall rest upon the saddle; but in this location the muscular action of the legs is less effective, which renders the work of propulsion greater.

Dickinson[1] states that 9 out of every 10 bicyclists are ignorant of some of the rules of good riding, and that unmerited disrepute is thus thrown on the most alluring and practicable, as well as the most generally beneficial, of the outdoor exercises for women. He lays stress on a careful increase of length and difficulty of the ride; on heeding the warning given by palpitation and labored breathing—signs of strain of the right heart, which is only robust in laborers and athletes; on frequent rests; on care about chilling and over-fatigue; on light food during exercise; and on rest after riding. Saddles must differ as pelvic floors, as buttock contours, and as thigh modellings differ. A narrow saddle, permitting the wide pubic angle to straddle it, will bring weight on the vulva, and a saddle tilted downward in front will slide the trunk forward on to the narrower portion of the saddle. Dickinson claims that investigation proves sexual feeling not to be aroused or self-abuse fostered by wheeling. The scorching position is the only attitude in which the pubic arch is likely to span the front pommel or the vulva to come in full contact with the saddle. Some of the injurious and not uncommon defects in saddles are—a center ridge; sagging, or the hammock-shape; narrowness; and a vicious tilt. The available types of saddle he roughly classifies as follows: First, the narrow man's saddle, suitable to a few women; second, the most commonly used and most useful of all, the modified male type of the shorter, broader, flatter form, supplied with most wheels on request. It should not be less than 8 inches wide. As examples are the Mesinger, Garford, Hunt, and Reform Wheeler. There is the saddle with the pad on each side to carry the weight, with a deep groove in the center and without front pommel. Of these the best is the Christy. Many people find comfort and relief to perineal pressure in this seat. It is less secure than the usual form, and chafes some riders. Doolittle[2] says that in cases of pus-tubes, of acute inflammation,

[1] Am. Gynæc. and Obst. Jour., June, 1896.

[2] Canad. Pract., May, 1896.

or immediately following inflammation with exudations—in fact, in any condition in which pelvic massage would be contraindicated—the use of the bicycle should be proscribed. It is, however, of service in subacute metritis or in subinvolution, and in pseudohysteric cases of uterine origin.

[There are but two possible objections to bicycle-riding in women. The one, over-exertion, should be and is easily controlled; the other, pressure on the vulva and its results, is entirely eliminated by the use of the Christy or some similarly devised saddle. Bicycle-riding can do no possible harm to a healthy woman, any more than it can to a man, unless it be abused. For neurasthenics in particular it is an exceedingly valuable remedy—probably the most valuable we have.]

The Phenomena of Menstruation.—Joubert[1] from a careful study of the supposed influence of tropical climate on menstruation, based upon over 3000 patients between the ages of 10 and 19 years, arrives at the conclusion that the reason why girls in tropical countries menstruate at a relatively earlier age than Europeans is not the influence of the climate, but of too early sexual excitement, the direct result of the social life of these people, in whom very early marriages are the rule. Kisch[2] notes the following phenomena in connection with the establishment of the menstrual function: 1. Palpitation and tachycardia in individuals otherwise healthy, appearing before the first menstrual discharge and persisting for some time afterward; 2. Cardiac irregularity in chlorotic females; 3. Hypertrophy of the heart, which develops at the time of maturity, caused by the circulatory disturbance which then occurs, as well as by the rapid growth of girls and improper habits of dress. Van Meerdervoort,[3] from a study of uteri removed during menstruation, concludes that in consequence of vasomotor dilatation of the pelvic vessels the cervical and corporeal endometrium becomes intensely congested, resulting in a transudation of blood, as well as in an increased secretion of mucus. When the congestion and resulting serous infiltration are moderate, corresponding to a condition of slight capillary congestion, the menstrual flow is slight, and the reverse. The degree of congestion depends upon the intensity of the ovarian stimulus.

Depasse[4] says that cold bathing during menstruation is a beneficial measure, provided women accustom themselves to the treatment by bathing every day for at least 8 days before the arrival of the period, when they can continue during the menstrual flow without any danger. In the case of a very anemic girl, in whom this treatment was instituted, it gave most satisfactory results. Houzel, before the recent Boulogne Congress, held that cold salt-water baths facilitate the menstrual flow, increase the duration of genital life, and likewise increase fecundity in a remarkable manner.

Precocious Menstruation.—E. G. Woodruff[5] records the following interesting case of unusually early menstruation, which he was able to see and

[1] Indian Med. Gaz., Apr., 1895.
[2] Berl. klin. Woch., 1895, No. 39.
[3] Centralbl. f. Gynäk., 1895, No. 49.
[4] Buffalo Med. Jour., Oct., 1895.
[5] Med. Rec., Mar. 7, 1896.

examine through the kindness of Prof. A. Monti at the Policlinic in Vienna on Jan. 23d. The face and general appearance were those of a well-developed girl of 14 or 15 years of age. The child is of the brunet type, and stands 118 cm. in height. The chest measure is 72 cm., and that of the pelvis with the pelvimeter is as follows: At the crest of the ilium, 20 cm.; at the anterior superior spine, 21 cm.; and at the great trochanter, 25 cm. Upon inspection the breasts were found to be full, firm, and round. The mons veneris was covered with hair. The hymen was present, and the uterus was found on rectal examination to be normal. According to the statements of the mother, the child began to menstruate at the age of 2 years, and has done so regularly since, the flow being normal in amount. Menstruation appeared as usual between the twelfth and fourteenth years in the mother and five sisters of the child. The general health of the child seems up to the present time to be undisturbed in any way by this menstrual precocity.

Vicarious Menstruation.—Kutner,[1] in a study of vicarious menstruation, states that bleeding from the stomach is much more frequent than vomiting of blood, but it can only be diagnosed by examination of the feces. The hemorrhage often comes on periodically in connection with menstruation, or, more frequently, at the menstrual epoch in patients suffering from amenorrhea. Hemorrhage from an ulcer of the stomach is also frequently dependent upon a menstrual period. The differential diagnosis between an ulcer of the stomach and menstrual hemorrhage from the stomach is by no means easy, and in some cases it can only be made out by resorting to a prolonged rest-cure. Want of success will indicate that no ulcer is present.

Amenorrhea and Chlorosis.—Clement[2] affirms his belief in the infectious origin of chlorosis, founding his opinion on the similarity between this and other infectious diseases. He observed an epidemic form in a small village, in which 8 young girls under favorable hygienic conditions were successively affected, fever being the initial symptom. Enlargement of the spleen was constant, phlegmasia alba dolens, dry pericarditis, and pleurisy being frequent complications. These could hardly be explained by a simple disturbance of the hematopoietic function. [This cannot be accepted as a probable explanation of this common condition, which is of such frequent occurrence that its specific cause, if it were infectious in nature, would have been demonstrated long ere this. It is probably only another instance of the general tendency of the day to ascribe all diseases to a specific virus. It is much more rational to attribute the disease to a profound anemia consequent upon the rapid growth and development of the girls at this period of their lives, together with an associated alteration in the body-metabolism.]

In the treatment of amenorrhea Lutaud[3] recommends gymnastic exercises, hydrotherapy, sea-bathing, and saline spring baths. When the amenorrhea is accompanied by obesity, active purgation must often be employed, and this increased at the approach of the period. In obstinate cases success has

[1] Berl. klin. Woch., 1895, Nos. 7–9. [2] Centralbl. f. Gynäk., 1895, No. 40.
[3] Therap. Gaz., Nov. 15, 1895.

attended the use of *Mompanthis trifoliata*. This is given in infusion, made by adding 1 oz. of the drug to 6 oz. of boiling water, macerating it over night, and is taken in small quantities during the next few days.

Menorrhagia and Metrorrhagia.—As to the origin of excessive menstrual and intermenstrual discharges, Bloom[1] states that they can nearly always be traced to chronic endometritis, subinvolution, pressure of submucous fibromyomata or other uterine neoplasms, malignant disease of the uterus, or faulty positions of this organ. The ovarian and tubal origin of these hemorrhages must not be overlooked. In all cases of organic disease of these structures there is an associated endometritis that gives rise to the repeated bleedings. Bloom has studied upward of 500 cases of excessive bleeding, either menstrual or intermenstrual, observed in the Gynecean Hospital in the services of Drs. Penrose and Baldy. Ten % or 50 women, showed no pathologic condition from a physical examination. Carcinoma and suspected malignant disease of the uterus accounted for 5%, or 25 cases. Fifteen of these women came under hospital observation; 7 were too far advanced for extirpation; in 8 hysterectomy was the operation selected; and in all cases the diagnosis was verified by microscopic examination. The average age in these women was 41 years 3 months, the oldest being 63 years of age, and the youngest, an African, of but 28 years and a hopeless case. They were all multiparæ, and the average number of pregnancies was 4½. Tuboovarian disease represented the cause of bleeding in 20%, or 100 of the cases. There were 2 cases of extrauterine disease that gave histories of profuse bleeding. In 10%, or 50 cases, faulty positions were responsible for the excessive bleeding, and of this number fully 80% were retrodisplacements. In the remaining cases, or nearly 45%, the bleeding was traceable to an endometritis or subinvolution.

Sivitalski[2] calls attention to the rare occurrence of metrorrhagia without any discoverable local or general cause, and states that he regards this condition as a clear indication for total extirpation. He reports the case of a woman, aged 29 years, who began to have profuse metrorrhagia a week after the cessation of the menstrual flow. The same phenomenon was noted after the following period, when the patient became so exsanguinated that she entered the hospital. The removal of a quantity of hypertrophied mucous membrane by curettage failed to check the bleeding, which recurred a few weeks later and could not be controlled. She was readmitted to the hospital, and a digital examination of the uterine cavity was made with a negative result. It was finally decided to perform hysterectomy, for the patient was *in extremis*. A careful examination of the specimen threw absolutely no light upon the cause of the hemorrhage, as the only pathologic change noted was a minor degree of interstitial endometritis. The adnexa were normal. The patient developed a pelvic abscess, but eventually made a good recovery.

Steam as a hemostatic in cases of uterine hemorrhage has been claiming of late a considerable amount of attention. Zacharine,[3] Snegirjoff,[4] and

[1] Codex Medicus, Feb., 1896.
[2] Centralbl. f. Gynäk., 1895, No. 33.
[3] Rev. de Thér., 1894, No. 22, p. 626.
[4] Centralbl. f. Gynäk., 1895, No. 3.

Pincus,[1] all endorse the method as of undoubted value, particularly from a bacteriologic standpoint. Pincus recommends it in septic puerperal endometritis. For the last 7 years Snegirjoff has employed this method after dilatation and curetment of the uterine cavity. A small metal cannula attached by a rubber tube to a kettle containing water at the boiling-point is introduced into the cervical canal and the steam applied for 1 minute. It is always followed immediately by complete hemostasis, and is not associated with pain or other symptoms. Applied in carcinoma of the uterus, the fetid discharge and hemorrhage disappear and the pain is relieved. Experimentally applied to the uterine cavity of an extirpated uterus, the endometrium was found to be cauterized, and was covered with a thin white membrane. Thus, the steam acts as a cauterizant, hemostatic, anesthetic, and antiseptic. Prompted by these observations, Snegirjoff, with the assistance of Blagowolinof, carried out a series of experiments on animals with the following results: The liver was extirpated with the loss of but little blood, the animal living; also a portion of the spleen, lung, kidney, and brain. Hemorrhage from bone was controlled, a new growth of bone-tissue following the operation. A horn of the uterus of a dog was excised. Bleeding from a longitudinal or transverse incision in the femoral artery ceased after the application. Hemorrhage from muscle or skin ceased immediately. The operation was always followed by primary union. After this experimentation Snegirjoff began, in 1893, to apply the method in a series of operations at the Alexinas Hospital. In 5 cases of resection of the knee-joint the operation was performed without the use of an Esmarch tube, hemostatic forceps, or ligature; also in amputation of the breast for carcinoma, and in carcinoma, lipoma, and cavernous tumors of the skin, in the amputation of the cervix, in the operation of hysterectomy for fibroid tumors, and to control hemorrhage from the stump. After the incision of abscesses as a method of disinfection, and in hemorrhage from a sinus or fistula, particularly if the latter was tubercular, hemorrhage was controlled entirely by the use of steam in the manner described. Pincus[2] reports 9 cases in which steam was employed in controlling hemorrhage from the uterine cavity and in treating endometritis. [This remedy is worthy of additional investigation as to its antiseptic and hemostatic properties.]

Among the new remedies that have been recently employed to control uterine hemorrhage may be mentioned calcium chlorid[3] in the form of liquor calcii chloridi (B. P.) in from 2- to 3-dram doses. The strength of this preparation is 1 dram of the calcium chlorid to 5 of water. Its action is due to the fact that the blood coagulates much more readily under its influence.

Orthmann[4] has employed salipyrin as a hemostatic for uterine hemorrhage in 50 cases at the Martin Polyclinic. He reports 32 cases in which the patients were under observation for from 9 to 18 months. In 12 of these there was no positive improvement, in 12 others distinct improvement, and in 8 the result was very good. The best results were obtained in those cases of men-

[1] Centralbl. f. Gynäk., 1895, No. 11.

[2] Loc. cit.

[3] Routh, in Clin. Jour., Dec. 18, 1895.

[4] Berl. klin. Woch., No. 7, 1895.

orrhagia that follow labor and abortion. Those complaining of severe menstrual hemorrhage associated with pain were undoubtedly relieved. In 2 of these cases of menorrhagia with disease of the uterine appendages the result was good. In 4 cases of associated metritis, perimetritis, and oophoritis there was no apparent change, and the remedy was also of little or no use in 7 cases of uterine hemorrhage following salpingo-oophorotomy. Orthmann advises that salipyrin should be administered, if possible, for 1 or 2 days before the expected appearance of menstruation, and that it should be continued until the flow ceases. The dose advised is 15 gr. 3 times daily. He believes that further experimentation is desirable.

Schaeffer[1] recommends ferripyrin: (1) as a simple hemostatic in all forms of hemorrhage from the genitals in which cauterization is not desired; in menorrhagia and metrorrhagia; and in operations associated with parenchymatous hemorrhage when ligature is impossible; also in cases of endometritis when destruction of the superficial endometrium is required, and after curetment in those cases suitable for the application of ferric chlorid. It is here applied in a 16 to 18% watery solution with an intrauterine applicator. (2) As a hemostatic when an associated astringent quality is desired; in intrauterine and vaginal douches, as in endometritis, to control the hemorrhage and to act as a stimulant to the endometrium; also in metritis, as a method of depletion when there is excessive secretion; as an astringent vaginal douche in gonorrhea, kolpitis, and particularly when there is ectropion and inflammation of the cervical mucosa. It is here employed in a 1 to 1½% solution. It may also be applied as a powder on a tampon or otherwise. (3) It is applied as a powder in inoperable carcinoma of the cervix; it is the only powder that relieves the pain, controls the hemorrhage, diminishes the discharge, and yet does not cauterize. (4) In hematuria, in a 1 to 16% solution, it controls the hemorrhage and relieves the tenesmus. (5) In hemorrhage from the stomach and intestines and in melæna neonatorum it is given by the mouth in the same doses as the liquor ferri sesquichloridi.

Gottschalk[2] describes stypticin (cotarnin hydrochlorid) as a valuable hemostatic in uterine hemorrhage. It is an amorphous sulphur-yellow powder, giving with water a straw-yellow color that becomes darker on exposure to the light. Internally, it may be given in powder or capsules in ⅚-gr. dose 5 or 6 times daily. Hypodermically, 3 gr. (in a 10% solution) may be injected into the gluteal muscles if the hemorrhage be profuse. Besides its hemostatic properties, it seems also to relieve pain and even to be conducive to sleep. It is contraindicated in threatened abortion.

Dysmenorrhea.—A case of membranous dysmenorrhea is reported by John Madden.[3] The literature of this disease is scanty. Nearly all modern writers, especially those of Europe, regard it as a result of metritis. Schröder remarked that "chronic catarrh is so often found that it may be regarded as the cause of the disease." August Martin, Pozzi, and Lawson Tait express

[1] Centralbl. f. Gynäk., No. 2, 1896. [2] Therap. Monatsh., 1895, H. 12, S. 646.
[3] Jour. Am. Med. Assoc., Mar. 21, 1896.

similar views. The membrane itself is often not an inflammatory product. It has all the histologic characteristics of a normal membrane overgrown. The time occupied in the discharge of the membrane varies considerably, but usually occupies from 2 to 5 days. It may be thrown off slowly and in separate pieces, or it may be passed entire. Duke[1] says that the membrane is obviously composed of the superficial layer of the endometrium, with perhaps an abnormal amount of connective tissue. Duke has met with satisfactory results from the following treatment: The os externum is scarified at intervals of 3 or 4 days between the periods; just before the flow is expected the cervix is dilated, the interior of the uterus is thoroughly curetted, and a spiral wire stem is introduced, which is worn continuously during at least 3 subsequent periods, the patient being directed to take hot vaginal douches even when menstruating. No harm has resulted from the use of the stem, and the patient is able to attend to her ordinary duties. [The use of stem-pessaries of any form and for any condition of the uterus cannot be recommended, on account of the evident risks attendant upon their employment—namely, the danger of uterine perforation and aggravation of the existing inflammation.] Croom[2] objects to the term "intermenstrual dysmenorrhea" which has been applied by the French to the form of dysmenorrhea, so called, which occurs at mid-term, and much prefers the German name of "Mittelschmerz." The condition is a well-marked one, wherein an attack of dysmenorrhea proper is simulated, without, necessarily, any external hemorrhage. It does not at all resemble the premenstrual pain or the continued pain associated with inflamed or diseased ovaries, but it is a condition that occurs definitely each month, at a definite period and for a definite number of days. It may be considered as having three different manifestations: 1. A group of cases in which there are no external manifestations; 2. Those cases in which the pain is associated with an escape of blood; 3. Those cases in which the intermenstrual discharge is associated with a clear discharge. This classification, Croom believes, gives a fair insight into the different states that may lead to the production of this somewhat unusual symptom. (1) With regard to those cases in which no external manifestation accompanies the occurrence of Mittelschmerz, the explanation is probably to be found in the fact that ovulation and menstruation do not in these cases occur simultaneously; that, in addition, owing to thickening of the capsule of the ovary or some such cause, dehiscence of the follicle occurs with pain. (2) In those cases associated with escape of blood there is generally a coexistent endometritis, accompanied by well-marked pain during the passage of clots. Such a condition should scarcely come under the category of Mittelschmerz at all. (3) In those cases in which a leukorrheal discharge occurs with the pain the cause is probably a hydrops Fallopii reaching its full development at mid-term.

The *treatment* of dysmenorrhea will depend upon its cause. In those cases dependent upon cervical stenosis Braithwaite[3] recommends the use of Hegar's

[1] Med. Press and Circ., July 10, 1895. [2] Edinb. Med. Jour., Feb., 1896.
[3] Brit. Med. Jour., June 29, 1895.

dilators under anesthesia on the last day of the menstrual period, immediately after the cessation of the discharge, when the tissues are soft and elastic. The advantages claimed for this method are the avoidance of inflammation and sepsis, of which there is considerable risk when tents are used, and the rapidity with which dilatation can be effected; there is less danger of injuring the tissues, he claims, as they stretch more easily than at other times and the dilatation is more permanent. The danger of the use of morphin in all cases of dysmenorrhea is urged by Macnaughton Jones.[1] Mayet[2] claims excellent results from the use of the following prescription: Iodoform, 5 grams; cocain, 1 gram; oleic acid, 4 grams; sterilized vaselin, 100 grams. A fine aseptic sponge is saturated with the material and applied to the cervix before the patient goes to bed. It is removed in the morning. Care must be taken to prevent cocain-poisoning.

Menopause.—Jouin[3] calls attention to the very intimate relation which, he believes, exists between the menopause and pathologic conditions of the uterus and Basedow's disease. In this relationship he places exophthalmic goiter in the position of an effect or consequence, and not the cause, of the uterine condition. He proves this point by citing 43 cases that came under his own observation in which the uterine lesion was observed to precede the goiter. Moreover, an improvement in the local condition is always followed by the appearance of the general disease. The author believes that this coincidence of these morbid processes is comparatively common, but exophthalmic goiter under these circumstances nearly always presents itself under obscure clinical forms. He suggests, therefore, that this disease should be differentiated and carefully searched for in each case. The menopause may, in like manner, determine the onset of Basedow's disease, and the author is inclined to admit that this form of goiter plays a considerable part in the pathology of approaching age.

Theilhaber[4] from personal observation in several cases infers that in certain individuals who are predisposed to morbus Basedowii it may result from pathologic conditions of the pelvic organs, while, conversely, disturbances of these organs may be directly due to the disease itself. Pregnancy, hemorrhages, and operations, especially castration, may be etiologic factors. Atrophy of the uterus and adnexa may result, as is shown by the fact that menstruation is always scanty or absent in the thyroid disease. That more cases have not been reported is doubtless due to the fact that few patients have been carefully examined with the view of determining this point. This atrophy, he believes, is due to vasomotor influences, and not to anemia, as is usually stated.

As a practical deduction from the foregoing, Theilhaber states that young women with Basedow's disease should be advised not to marry, while the married are warned that the course of the disease may be unfavorably affected by pregnancy and the puerperium, and that the children which they bear are likely to be highly neurotic. Atrophy of the genitals demands no treatment,

[1] Brit. Gyn. Jour., May, 1895.
[2] Soc. de Sci. méd. de Lyon, May, 1894.
[3] Nouv. Arch. d'Obstét. et de Gynéc., 1895, No. 6.
[4] Arch. f. Gynäk., Bd. xlviii. H. 3, 1895.

which, in fact, is useless. The prognosis is not hopeless, since their functions may be restored with an improvement in the disease. Local treatment is only required in the rare cases in which the existing anemia is increased by profuse uterine hemorrhages, when curettage is indicated. Neoplasms should, of course, be dealt with according to the usual rules. H. L. E. Johnson[1] reports 3 cases of atresia of the uterus occurring after the menopause. He believes that this occurs pathologically much more frequently than is supposed. The atresia is physiologic only after complete atrophy of the body of the uterus and its endometrium. The symptoms of the condition mislead by directing attention to the nervous system more particularly than to the true seat of disease. The uterus during the menopause, and until completely atrophied, should be kept under careful observation, all inflammatory, catarrhal, and other abnormal conditions cured, and the canal kept pervious by the frequent passage of the uterine sound. Atresia of the cervix, without complete atrophy of the uterus, should be operated upon at once, even in advance of symptoms.

[Castration for the cure of Basedow's disease has been advocated by Blocq, but there are no scientific grounds for its support.]

Tachycardia in women may, according to Baldwin,[2] occur at any period of life. It is rare, however, before puberty and after 50 years of age, and is most often seen during the menopause. Those who pass through the change early are more liable to it than those who menstruate until later in life. It occurs with special frequency when the menopause has been prematurely induced by surgical operation or by disease. Kisch, who has seen 28 cases in 5 years, concludes that it is due to the hyperplasia of the stroma of the sexual organs. This increase of connective tissue acts in some way upon the terminal fibers of the sympathetic nerves. As regards treatment, Baldwin remarks that if tachycardia be due to excitation, opium would give the best results, while, on the other hand, if it result from paralysis of the pneumogastric, digitalis would be an ideal remedy. These two agents are the best remedies at our command, but in many cases they prove utterly worthless. Galvanism has been most effective in Baldwin's hands, but its action was limited to the time in which the current was applied.

UTERINE ANOMALIES.

Congenital defects of the reproductive organs of the woman are, according to Dorland,[3] not so rare as one would at first sight imagine. In about 3500 women personally examined by him in the past 10 years, in 3 instances there were detected double uteri; once there was found a double vagina in association with a duplex uterus; in 1 instance there was a rudimentary condition of the uterus and vagina, the latter measuring in depth not more than 2 in., while the uterus, examined per rectum, was not larger than a hazelnut; and in 1 case there was apparently an entire absence of the uterus, while the rudimentary vagina measured 1½ in., the organ ending abruptly above in a culdesac.

[1] Jour. Am. Med. Assoc., Dec. 7, 1895. [2] Brooklyn Med. Jour., Nov., 1895.
[3] Phila. Polyclinic, Nov. 30, 1895.

The variety of the congenital defect of these organs depends upon the time in embryonic development at which the disturbing factor begins to act. Most commonly this occurs late in embryonic life, after the ducts of Müller have attained their full maturity, but prior to the time at which they have fully coalesced to form the generative organs. The various forms of double uteri and vaginæ are thus evolved. If, however, the arrest of development occur prior to the formation of the uterus by fusion of these ducts or prior to the development of the ducts of Müller themselves, either one or both of these structures fail to appear; in the former instance there results a uterus unicornis, or one formed by but a single Müllerian duct; in the latter case no trace of the uterus can be detected on manipulation, even when the patient is completely relaxed under the influence of an anesthetic. If, however, the pelvic cavities of such individuals could be examined carefully after death, it is not improbable that in almost all, if not in every case, some trace of the missing structures could be detected, microscopically if not macroscopically, in the form of fragments of rudimentary muscular tissue. To all intents, however, the uterus is absent in these women, and such cases must be handed down in medical records as instances of congenital absence of that organ.

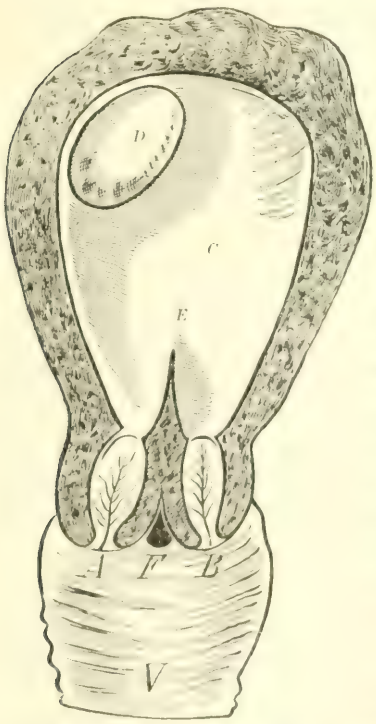


FIG. 111.—Double uterus associated with submucous fibroid tumor: *A*, Right cervix; *B*, left cervix; *C*, common cavity for the body of the uterus; *D*, submucous fibroid; *E*, remains of septum just above the internal os on each side; *F*, falciform fold of vaginal mucous membrane; *V*, vagina (Lancet, Mar. 21, 1896).

Lewers[1] reports a case of double uterus associated with a submucous fibroid tumor (Fig. 111) in a woman, 38 years of age, who had been married 14 years, but had never been pregnant. The catamenia appeared when she was 15 years old, but she was not regular until she was 21, several months intervening at times between the periods. For 7 months before examination she had suffered from increasing metrorrhagia and dysmenorrhea. Examination under anesthesia revealed a curious falciform fold of mucosa (*F*) at the upper part of the vagina, running from before backward and from right to left; this separated the two vaginal portions of the cervix uteri. A sound introduced into each cervix passed 4½ in. The submucous fibroid, the size of a large walnut, was felt attached at the fundus of the enlarged uterus and to the right side. It was pedunculated, and readily removed by torsion. Further examination showed that there was but one uterine cavity, which connected with the two cervical canals. There

[1] Lancet, Mar. 21, 1896.

was a sort of spur (*E*) felt a little above the level of the internal os. [The case is of especial interest on account of the unusual association of the fibroid neoplasm with the rare congenital defect; also on account of the unusual situation of the septum between the two uteri. More generally it is the upper part of the septum that persists, while that corresponding to the cervical region disappears.]

A case of absence of the uterus and its adnexa, together with a rudimentary condition of the vagina, is reported by Mehrer;[1] a case of double uterus and double vagina is reported by Sprigg;[2] Jacobi[3] reports a case of absent uterus; while Shoemaker[4] reports 1 case of uterus cordiformis, 1 case of partial vaginal septum, and 2 cases of infantile uterus. Clapham[5] records a case of congenital absence of the uterus in a young girl, 19 years of age, who had never menstruated. An examination of the abdomen revealed two lumps at the upper end of the inguinal canals about the size and shape of ovaries, which organs they probably were. The patient had suffered from anemia for 2 years. At 16 years of age her breasts began to develop, and became very full and large. Pubic hair only appeared 3 months before examination and was very scanty in amount. The girl had suffered at intervals from seizures somewhat resembling attacks of minor epilepsy. Under chloroform examination the external genitals were found to be typically feminine in character, though presenting a somewhat youthful appearance, the vulvar slit coming very far forward. The labia were well developed, the clitoris and meatus urinarius normal in size and position. The vagina was 2 in. in length, admitting the index finger with difficulty, and was found closed at the upper end. The uterus was totally wanting. The patient had never had any sexual feelings. Jacobi, who has made a close study of these abnormal conditions, concludes that there may be—1. Absence of the uterus with rudimentary development of the external genital organs (atrophy of the middle segment of the genital apparatus, imperfect development of the external segment); 2. Absence of the uterus with hernia of the ovaries; 3. External organs ambiguous and rudimentary, internal organs masculine; 4. External organs ambiguous, habitus masculine, nature of deep gland uncertain; 5. External organs masculine, internal feminine, habitus feminine; 6. External organs feminine, internal masculine; 7. Middle segment of the generative organs bisexual, external masculine; 8. Bisexualism of the three segments.

UTERINE INFLAMMATION.

Metritis.—Sellman[6] strongly endorses the old classification of Thomas of disease of the uterine substance into "chronic metritis" and "areolar hyperplasia." He claims that there is a marked difference between the two. There is a chronic inflammatory condition in which the uterus is soft, edematous, increased in size, and containing an increased amount of blood. This is

[1] Wien. med. Woch., Sept. 28, 1895.
[2] Am. Jour. Obst., July, 1895.
[3] Ibid., Oct., 1895.
[4] Ibid., Aug., 1895.
[5] Quart. Med. Jour., Sheffield, Apr., 1896.
[6] Am. Jour. Obst., Nov., 1895.

true metritis. When there is permanent blood-stasis the vessels become distended, their walls lose their tonicity, and certain elements of the blood contained within them, by a method of exosmosis, pass into the cellular tissue or perhaps even between the muscular striæ. The size of the organ is increased by this excessive amount of blood and serum. There is pressure made upon sensitive nerve-filaments which gives rise to the pain and sensitive condition experienced by patients suffering from this disease. Plastic material is thrown out into the walls of the uterus. Nature attempts to take care of this material, and does absorb it to a certain extent, but her powers are insufficient in many instances to take up from the uterine tissues the material thus thrown out of the circulation; there results, therefore, an overnutrition of the muscular fibers and of the utricular glands, with consequent thickening of the walls of the uterus and increased secretion. This accounts for two conditions present in uterine hyperplasia—namely, increase in size and weight, and the enormous quantity of glairy, white-of-egg secretion. Bertelsmann[1] finds as the result of his microscopic studies that in cases of metritis, carcinoma, and interstitial fibromyoma of the uterus the muscle undergoes a hyperplasia, the tissue becoming softened and stratified and the cells swollen, much as in the pregnant uterus. Duncan[2] also emphasizes the hypertrophy of the connective tissue, that is also usually associated with some muscular hypertrophy. The arteries and veins are much thickened by hypertrophy of the tunica adventitia. The connective tissue remains permanently hypertrophied, and does not undergo cicatricial contraction.

At the French Congress of Internal Medicine, held at Bordeaux, du Magny[3] described a special form of metritis developing in the course of uremia, and characterized by a vaginal discharge of varying degree and color, of irritating properties, and manifesting an odor like that present in cases of uterine carcinoma. On palpation the uterus in this disease feels enlarged and softened in places. On ocular examination the cervix appears reddened and swollen, and its lips are the seat of numerous small prominences of varying size, resembling nodules of epithelioma. All of these phenomena disappear with the other uremic manifestations.

Madlener[4] states that Neisser's gonococcus is capable of penetrating the muscular tissue from the endometrium, and there causing inflammation which may proceed to the formation of abscesses. This occurs most frequently in puerperal cases. The gonococcus soon disappears from the muscular tissue either by destruction or by emigration. By invasion of the serous membrane from the endometrium the peritoneum may be infected without any tubal disease. In this way perimetritis in gonorrhea may be explained. In sections from a uterus removed 7 weeks after confinement Madlener demonstrated the presence of gonococci among the muscular fibers. Forms clearly showing diplococci and corresponding in size to the gonococci were found in sections taken longitudinally from the fundus. The cocci were found in pairs,

[1] Arch. f. Gynäk., 1895, B. v. H. 1.
[2] Lancet, July 20, 1895.
[3] Mercredi méd., 1895, No. 41, p. 487.
[4] Centralbl. f. Gynäk., Dec. 14, 1895.

usually between the cells of inflammatory exudate, and sometimes between the muscle-cells. They were found in sections taken from the anterior and posterior walls of the body and from the cervix. The gonococci remain for years in mucosæ, and can be demonstrated there, but the uterine muscular tissue is not a favorable soil for a prolonged stay or for propagation. Madlener believes that many uterine abscesses are caused by the gonococci.

For the relief of chronic parenchymatous metritis Talley[1] employs irrigation of the uterus with 1 or 2 gallons of alkaline solution at a temperature of 110° F., using for this purpose a specially devised irrigating tube providing a return flow, and small enough in diameter to pass through a No. 15 French catheter gauge. The action of the application of heat and moisture is to cause, first, vasomotor dilatation, and subsequently vasomotor contraction. The mucous secretions are dissolved and washed away by the alkaline solution, leaving a clean membrane. Following the irrigation, about 20 minims of a mixture of equal parts of Churchill's iodin and carbolic acid are injected into the uterine cavity by means of a Braun syringe, and a cotton tampon, well saturated with glycerin, is tucked neatly against the cervix. This is to support the uterus and to deplete it by the affinity of glycerin for the serum of the blood. Such treatment is applied twice or thrice a week. Conjoined with the local treatment care is given to securing mild exercise, nourishing diet, and the administration of iron, arsenic, and strychnin.

[This method is only applicable to cases in which the *cervical canal is patulous;* unless such cases are selected the physician will be embarrassed by severe uterine colic following his treatment.]

Endometritis.—An elaborate classification of endometritis based exclusively upon the result of bacteriologic research is offered by Winckel[2] to replace the old groupings according to the anatomic characteristics, the symptoms, or the etiology. According to the new system, endometritis may be divided into two general classes: 1. Simple endometritis, or that in which bacteria have not been discovered. This class includes—(*a*) Endometritis due to troubles of the circulation; (*b*) Endometritis from intoxication or infection; (*c*) Endometritis post abortum or decidual; (*d*) Endometritis exfoliativa. 2. Purulent endometritis, or endometritis of bacterial origin, comprising—(*e*) Gonorrheal endometritis; (*f*) Tuberculous endometritis; (*g*) Septic endometritis; (*h*) Saprophytic endometritis; (*i*) Diphtheric endometritis; (*j*) Syphilitic endometritis; (*k*) Blastomycetic endometritis; (*l*) Protozoic endometritis, or endometritis from protozoa.

While this classification corresponds to our present knowledge of the subject, it is probable that we shall find bacteria in some of the inflammations now classified as simple. *Simple* endometritis occurs at all ages. It is due to disturbances of circulation caused most frequently by tight corsets, also by constipation and the introduction of foreign bodies in the vulva or vagina. At a more advanced age it is usually due to some one of the numerous lesions incident to labor, neoplasms, or to some affection of the ovaries, as pointed

[1] Physician and Surgeon, Dec., 1895.

[2] La Sem. méd., 1895, No. 30

out by Brennecke and Czempin. Lesion of some remote organ can bring about a congestion of the uterus and become the secondary cause of an endometritis. In the group resulting from *intoxication* are included those following extensive burns, those caused by phosphorus-poisoning, and those following infectious diseases, as cholera, small-pox, or scarlet fever. *Endometritis postabortum* is due to retention of more or less of the membranes after a miscarriage or abortion, and the irritation and congestion due to their presence. In *endometritis exfoliativa* there is no purulent infiltration; the false membrane is expelled at more or less regular intervals, but without suppuration. In the intervals there are usually no leukorrhea and discharge from the uterus.

The endometritides of bacterial origin are arranged in the following order, according to their frequence: Gonorrheal, septic, saprophytic, and the less common forms, tuberculous, syphilitic, diphtheric, blastomycetic, and protozoic.

As a common cause of endometritis among young women should be mentioned imprudence during menstruation, cold baths, foot-baths, sitz-baths, and masturbation. Certain diseases, as chlorosis, anemia, Bright's disease, morphinomania, and hysteria, can also cause the disease. As age advances the sexual functions with their complications are the important factors in producing the disease.

As regards frequency, endometritis is probably more often met with than any other disease affecting the female genitals. Among 21,685 women treated at the clinics of the Prussian universities, 2236, or over 10%, were suffering from endometritis. The symptoms should be divided into three groups, as follows: local symptoms, symptoms of neighboring organs, and general symptoms. The first class includes anomalies of secretion, menstruation, and conception. The secretion is variable, sometimes abundant, especially in senile endometritis, sometimes inconsiderable. It is also variable in color. Often it is difficult to determine whether it come from the cervix or the body of the uterus, although catarrh of the body is much less frequent than from the cervix. The same can be said of hemorrhage; it is sometimes abundant, sometimes slight, and sometimes fails entirely. The pain depends upon diverse causes. It is expulsive when there is an obstruction of any kind or a membrane to be expelled. It is "dull" or "shooting" when the nerve-endings are denuded by erosions or ulcerations at the cervix.

The results of endometritis are—swelling of the mucous membrane, destruction of the ciliated epithelium, sterility, and abortion if the patient become pregnant.

Only a portion of the cases begin with an acute stage; the others are chronic from the start. This is especially true of those cases of endometritis met with in chlorotic and anemic individuals. An explanation of the persistence and severity of this form of catarrh can be found in the complex structure of the tissue and the numerous and complex functions which it performs.

Bumm[1] believes that the bacteria sometimes found in the uterus are there

[1] La Sem. méd., 1895, No. 30.

by chance and have no pathologic significance. He does not believe that chronic endometritis is always due to an acute or subacute invasion from streptococci or gonococci. Döderlein[1] of Leipsic, speaking on the subject of the relation of endometritis to the process of generation, adopted the three heads: (1) The influence of endometritis on pregnancy, parturition, and the sequelæ of labor; (2) The sexual act as a cause of endometritis; (3) Infective endometritis after childbirth. Fungoid endometritis, continuing during pregnancy under the form of a decidual endometritis, is a frequent cause of abortion, quite as potent as syphilis, but differs from that disease in that after vigorous treatment the mother may produce a perfectly healthy child notwithstanding numerous previous abortions. Interstitial endometritis, either acute or chronic, is the chief cause in the production of decidual endometritis, and in rare cases we see forms of glandular endometritis running into cystic degeneration (hydrorrhœa gravidarum). Most of the adherent placentas are also due to interstitial endometritis.

In describing the pathology of endometritis Duncan[2] adopts the old classification of chronic hemorrhagic or villous endometritis, chronic catarrhal or glandular, and chronic interstitial endometritis. In the villous form the mucosa is greatly hypertrophied, perhaps to 4 or 5 times its usual thickness; it is deeper in color, and, instead of being smooth, has become fungoid and the projections may form true polypi. In some cases there are found small transparent vesicles, which under the microscope are seen to be dilated glands, the openings of which are closed by connective tissue. The interglandular tissue is very vascular. In the glandular or catarrhal form the glands are enormously increased in size and become convoluted at their deep extremities; there is also an increase in their number, so that both hypertrophy and hyperplasia coexist, but otherwise the glandular tissue is normal in structure. In the interstitial form a new connective tissue is developed between the glands, and in some parts it converts the latter into cysts; in others, of longer duration, the glands may have disappeared altogether, so that the mucosa is represented by a layer of connective tissue lined by epithelium.

Müller[3] has noted the condition of the pelvic organs in 157 cases of influenza, 21 women being pregnant. Of the latter 17 aborted. Of the nongravid women, all but 3 showed symptoms of uterine disturbance, either hemorrhage or an aggravation of the previous troubles. Hemorrhagic endometritis commonly developed, as in cholera, typhus, and other infectious diseases. After the decline of the disease the uterus was frequently found to be enlarged and evidences of chronic endometritis were present, which seemed to be directly due to the influenza.

Two cases of **tuberculous disease** of the uterus are described—1 by Emanuel[4] of primary tuberculosis of the cervix, and 1 by Reverdin and Buscarlet[5] of secondary tuberculosis of the uterus involving the external os

[1] La Sem. méd., 1895, No. 30.
[2] Lancet, July 20, 1895.
[3] Münch. med. Woch., 1895, No. 41.
[4] Zeit. f. Geburtsh. u. Gynäk., Bd. xxix., 1895.
[5] Rev. méd. de la Suisse Rom., Aug. 20, 1895.

in a woman 30 years of age. In the latter case a soft circular ulcer was found on the cervix, its base rose-colored and covered with very fine yellow points. Curetment of the cavity and of the surface of the ulcer removed a red pulp mixed with small yellow masses, which contained, on bacteriologic examination, numerous tubercle bacilli. In Emanuel's case the primary lesion was found in the cervix uteri, the vagina, uterine cavity, and perineum being secondarily infected. Only 2 cases similar to this have been reported. The perineum was found covered by a sloughing ulcer 4 in. in length and $\frac{3}{4}$ in. in breadth. A tumor the size of an apple was attached to the cervix, causing secondary ulceration of the surrounding vagina. The uterus was enlarged and anteflexed. There were no physical signs of pulmonary involvement.

T. S. Cullen[1] states that tuberculosis of the endometrium is usually secondary to that of the tubes, and so is confined at first to the fundus of the uterus. It may extend upward from the vagina, being due to infection through coitus. The disease may be divided into (1) miliary and (2) chronic diffuse, the latter form being by far the more common. In the early stages tuberculous endometritis cannot be recognized by the naked eye. Yellowish-white nodules appear beneath the surface, increase in size, making the mucosa rough, and then form ulcers that are shallow and appear wormeaten or with undermined edges. The entire endometrium becomes caseous, and an accumulation of this material may, if the cervix be occluded, simulate pyometra. The process extends to the uterine muscle, and may cause rupture of the uterus. The tubes, being first affected, usually show caseation macroscopically by the time the process has reached the uterus. The ovaries are usually normal. There are no fixed symptoms of the disease; those present are due to the disease of the tubes. Menstruation may be irregular. *The diagnosis can be made by microscopic examinations of scrapings*, except in the early stages, when the process is confined to the cornua and is not reached by the curet. The scrapings may appear normal to the naked eye, even when the disease is advanced. The treatment consists in the following: Curetting of the uterus has been advocated, but usually this leaves some of the mucosa intact, especially at the fundus, where the process is most advanced. As tuberculosis of the endometrium is usually associated with that of the tubes, it is best to remove both uterus and tubes if the latter are found to be tuberculous when the abdomen is opened for exploration or operation.

Colpe[2] reports a case of obstinate cervical endometritis that resisted the usual astringents and caustics. Finally, mycotic spores were found in the secretion, when lactic and salicylic acids were used locally on account of their known antibacterial effect, with prompt relief. The writer states that *mycosis of the cervical canal* is probably a more frequent cause of obstinate catarrh than is generally supposed.

In the discussion on endometritis before the German Gynecological Society, Wertheim[3] made the following deductions with regard to *gonorrhea of the*

[1] Johns Hopkins Hosp. Rep., vol. iv. Nos. 7, 8. [2] Centralbl. f. Gynäk., 1895, No. 27.
[3] Ibid., 1895, No. 26.

uterus: Next to the urethra the uterus is the favorite seat of gonorrheal infection. As a rule, the uterus is directly infected, and the disease is not infrequently confined to that organ. In uterine gonorrhea there is nearly always present an acute interstitial endometritis, though in a few cases the process partakes of the nature of the more chronic glandular variety. In many instances there is an inflammatory infiltration of the muscle, with hyperplasia of the vessel-walls.

Sexton[1] prefers the term **postclimacteric endometritis** for that variety of endometritis occurring in women after the menopause. He thinks that the disease is different from the so-called *atrophic endometritis* that has been described. The most striking symptom is the discharge, which is watery, semipurulent, free from blood, barely staining the linen, and irritates the vagina and vulva as well as the surrounding skin. A characteristic odor is present, sometimes even more offensive than that of carcinoma. Abdominal pain and pain in the back are usual accompaniments, as well as progressive emaciation and invalidism; furthermore, a slow form of sepsis seems to invade the constitution, and the skin assumes a sallow appearance. In all of the cases there seems to have been an antecedent history of uterine disease. They are of long duration, even covering a period of 10 or 12 years. One case is reported by Sexton, and 3 by Maurange. Bell[2] considers endometritis as the one great cause of sterility, and also of flexions and oophoritis.

In the line of *treatment* Fenwick[3] believes that local bloodletting is, in certain cases, a most important and powerful remedy. The local abstraction of blood may be attained by using leeches or by scarification. The leeches are used externally only. He regards them as objectionable for use on the cervix, not only because they draw very little blood and leave a wound that heals badly in some persons, but because there is danger of their entering the uterus, and they may even pass through the Fallopian tube into the abdominal cavity. When the cervix uteri is deeply congested, deep-red, bluish, or purple in color, local depletion by scarification generally gives immediate relief. In cases of subacute ovaritis or obscure throbbing pain in the pelvis cupping or leeching externally frequently relieves the patient immediately.

Irrigation of the uterine cavity is one of the most generally employed methods of treatment for endometritis. Recently, Roesing[4] has conducted a series of novel experiments with a view to determining the extent to which the uterine cavity is reached by injections. For this purpose he employed freshly extirpated uteri, injecting colored fluids through different varieties of catheters, so that the endometrium would retain the staining. He found that the freer the outflow the less thorough was the irrigation of the cavity. The larger the amount of fluid which was injected, the more deeply did it penetrate below the surface. Sections of the uteri showed that healthy tissue was more deeply stained than diseased. He concludes that medicaments are brought most thoroughly in contact with the endometrium when introduced on applicators

[1] Am. Jour. Obst., Nov., 1895.
[2] Internat. Med. Mag., Feb., 1895.
[3] Lond. Med. Times and Hosp. Gaz., July 6, 1895.
[4] Arch. f. Gynäk., 1895, Bd. xlix. H. 2.

or by means of a Braun's syringe. [This probably would be true were it not for the sphincteric action of the cervical muscle, whereby fluids on the applicators are squeezed out before they enter the uterine cavity. The intrauterine pipet is therefore the better mode of treating the uterine mucosa.]

[The *curet* as an agent in intrauterine treatment has been very thoroughly investigated during the year, and, as might be expected, still holds its place as a most valuable instrument in the properly selected class of cases. Dumontpallier's claim that curettage as an operation is losing ground in France cannot be substantiated. Only when employed in cases not appropriate for such a procedure will unsatisfactory results be obtained.] Martin[1] enumerates the following indications for the use of the curet: (1) In endometritis, after failure of complete rest, hot douching, and tampons, with occasional swabbing with iodin, and in the absence of evidence of associated pelvic mischief. (2) In incomplete emptying of a pregnant uterus. If there be evidence of retained septic products, it is useless to dally with douches; curet as soon as possible prior to the onset of septicemia or pyosalpinx and general peritonitis. (3) In carcinoma as a palliative. In myoma it is useless, and other operative procedures should be adopted. (4) As a diagnostic agent.

Dorsett[2] regards the blunt curet as a dangerous instrument. The instrument with a sharp-cutting edge, properly constructed, is a most useful one. In order to secure a good scraping instrument the sharp edge should stand at an angle of 60° to the shaft or handle. A greater angle will not scrape thoroughly, and a lesser angle is liable to incise the uterine wall unless used with much care. According to Bouilly,[3] the curet can only be used with benefit in morbid conditions of the uterine mucosa and its subjacent tissue. In those cases attended with more profound alterations of the parenchyma and glands, with sclerous or sclerocystic degeneration (total parenchymatous metritis, cervical hyperplastic glandular metritis), no good can be expected from its use. In all cases of superficial infection, in the hemorrhagic forms of endometritis, in the caseous or caseiform metritis of aged women, and in the early stage of catarrhal metritis, it is of benefit. Pryor[4] regards the endometrium not as a mucosa, but as a lymphoid organ possessing no glands. The uterine follicles dip down into this tissue and are everywhere surrounded by lymphoid cells. This conviction has been forced upon him by the lack of physiologic function in the endometrium of the very fat; the remarkable activity in the absorptives that follows the removal of the uterus, similar to that noted after destruction of Peyer's patches by typhoid fever; the action of thyroid extract upon the absorptives, directly the reverse of that brought about by the removal of the mass of lymphoid uterus; the effect of hysterectomy upon the progress of phthisis pulmonalis; and the synchronous development of the thyroid and lymphoid endometrium. [There is nothing in the literature of the anatomy of the endometrium that upholds this theory of Pryor's; on the other hand, there is much to disprove it. Pryor himself in advancing the theory offers no

[1] Quart. Med. Jour., Oct., 1895.
[2] Buffalo Med. Jour., Mar., 1896.
[3] Therap. Gaz., Nov. 15, 1895.
[4] Am. Gyn. and Obst. Jour., Jan., 1896.

convincing proofs as to the truth of his assertions. For the present, therefore, the subject must be considered as not proven.]

The possible accidents of curettage are well grouped by Pichevin[1] as follows: 1. Abortion due to the rough use of the instrument within the gravid uterus, of which many cases are on record. 2. Septic infection, which has not infrequently resulted fatally in preaseptic days. 3. Rupture of a pyosalpinx, as in a fatal case reported by Rochet. In the event of such an accident vaginal hysterectomy or abdominal section should be performed without delay. 4. Atresia of the uterus after curettage has been noted by Polaillon and Fritsch, but is rare. 5. Perforation is the most frequent accident, a case being reported as early as 1854 by Richard, who, as well as Nélaton, called attention to the fact that it is often unattended by serious results. The same observation has been made by many subsequent writers. As regards the causes of perforation, Pichevin finds that softening of the uterine wall following pregnancy is the most common, perforation of the nonpuerperal uterus during curettage being quite rare. Frequent childbearing, tuberculosis, and possibly cardiac disease, seem to cause certain degenerative changes in the muscular tissue. If the softened uterus be retroflexed and fixed by adhesions, there is especial liability to the accident. The seat of the puncture varies, being most apt to occur at the angle of flexion when the uterus is retroflexed and adherent. The most common point is at the cornua, in the neighborhood of the tubal orifices, where the wall is thinned: as Léfour has shown, inflammatory lesions are most marked in this region. If a perforation is caused, Pichevin believes that in the majority of cases it will be sufficient to tampon the uterine cavity simply with gauze. Prolapsed omentum should be replaced if possible, or, this failing, the prolapsed portion may be excised.

A very rare accident after curettage is obliteration of the uterine cavity. If the operation be done in a too vigorous manner during the stage of fatty degeneration of the uterus following the puerperium, the muscular tissue may be so torn up as to induce complete union of the uterine walls. Outside of the puerperium such an accident could scarcely happen. Cases have been reported by Fritsch, Küstner, and Veit.[2] Veit believes that when the uterine cavity is completely obliterated it is useless to reopen it.

[We have known of several cases in which, after curettage for chronic metritis, there was an obstruction of the cervical canal for several months. One case returned home to the country, missed her first period, but had considerable pain; the second period was marked by severe, almost unbearable, pains, but no flow; the third period the pain became so great that we were telegraphed to hold ourselves in readiness to come and operate. The next day the telegram was followed by a letter saying that suddenly the patient had bled an enormous quantity, the hemorrhage stopped suddenly, the pains disappeared, and the patient was well. The uterine contraction had clearly overcome the obstruction. The second case followed much the same course.]

[1] Ann. de Gyn. et d'Obst., May, 1895.

[2] Centralbl. f. Gynäk., No. 36, 1895.

UTERINE DISPLACEMENTS.

Normal Position of the Uterus.—Penrose [1] remarks that no uterine ligament is inserted higher than its origin in the uterus; therefore these ligaments do not suspend the uterus when this organ is in its normal position. The main factor tending to hold the uterus in its normal position in the pelvis is the retentive power of the abdomen or the equality of pressure in all directions.

Mackenrodt [2] summarizes a paper on this subject as follows: Contrary to the usual statement, the pelvic fascia is not perforated by the vaginal canal, but surrounds and sends off to the cervix and vagina firm bands, those attached to the latter forming with it the strongest point of resistance to the abdominal pressure. The cervix uteri is so attached by the pelvic fascia as to occupy the position of slight anteflexion seen in the embryo. This normal flexion takes place in the cervix, the corpus uteri being inclined forward, while its axis remains perfectly straight. The uterus is kept in a position of anteversion by its ligaments, but remains passive in the direction of the upper portion of the cervix. Its own weight and the intraabdominal pressure also assist the organ in maintaining its normal position. The perineum offers only a slight resistance to the intraabdominal pressure. The real support of the uterus in its normal position is afforded by the attachment of the pelvic fascia to the cervix. Hence the deduction that the true cause of posterior displacements of the organ is to be sought for in relaxation of this fascia. In prolapsus the same condition is present plus atrophy of the muscles forming the pelvic floor, which may be due as much to general as to local causes. [It must be remembered that the normal position of the uterus is a variable factor dependent upon a number of associated causes, preeminent among which is the retentive power of the abdomen, which is itself founded upon an integrity of the pelvic floor and abdominal wall. The physiologic retroversion of the uterus due to natural accumulation of urine in the bladder is just as truly a normal position of the uterus as is the moderate anteflexion when the bladder is evacuated, and this great mobility of the uterus is one of the strongest proofs of its absolutely normal condition, everything else being equal.]

Lateral Displacements of the Uterus.—E. J. Ill [3] read a paper on this subject before the American Association of Obstetricians and Gynecologists at Chicago in September. He enlarges upon the importance of this abnormal condition, and thinks it has been generally overlooked, the patient's symptoms being attributed to other ailments. He has collected from his case-book all cases of lateral displacement except such as had presented tumors. In 14.2% of his patients there had been lateral displacement. He especially mentions those cases which he considers congenital, and in which the pain was referred to the elongated broad ligament. In these patients the symptoms begin early in the patient's sexual life, in the severer cases pro-

[1] Univ. Med. Mag., Apr., 1896. [2] Arch. f. Gynäk., Bd. xlviii. H. 3, 1895.
[3] Am. Jour. Obst., Nov., 1895.

gressing gradually to complete invalidism. The nonoperative treatment consists in endeavoring to elongate the shortened ligament by the use of dry wool or oakum tampons pushed between the cervix and the ilium on the side of the shortened ligament, keeping the tampon in place by a second and third one. All this is to be retained for 48 hours. A hot douche, with the patient on her knees and elbows, twice daily, when the tampons are *in situ*, is also ordered. He relates 2 cases of extreme suffering in which total extirpation of the uterus, tubes, ovaries, and broad ligament had been deemed advisable after years of unsuccessful treatment, in both of which the patients had been much relieved of their suffering by this method.

Uterine Prolapse.—Edge[1] states that uterine prolapse is due to—1. Deficient support from rupture of the perineum, with loss of a fixed point for the perineal muscles, and stretching of the levator ani muscle; 2. Deficient tone of the pelvic floor, including the bladder, urethra, and vaginal walls; 3 Intraabdominal pressure. To restore the uterus to its normal position it is necessary to repair the perineum, restrain abdominal pressure, remove congestion, and induce adhesion between the anterior rectal and posterior vaginal walls.

Niebergall[2] gives the results of the surgical treatment of prolapsus at the Bâsle Clinic in 110 cases. The operations usually performed were amputation of the cervix and anterior kolporrhaphy according to Fehling's method, followed 2 weeks later by Hegar's kolpoperineorrhaphy. Fehling denudes two long ovals on either side of the median line of the anterior vaginal wall, and unites their edges with silver wire. Seventy patients were seen or heard from, and of these 57 were cured at periods varying from 1 to 6 years after operation, 7 of the women having since borne children. The ultimate results were 20% better than those obtained by the ordinary operation in the anterior wall.

Gaertig[3] reports unfavorably upon the treatment of uterine prolapse by Freund's method. In 7 cases operated upon by him only 2 remained cured at the expiration of a year. Condamin[4] reports a case of ventral fixation for prolapse of the uterus. Rendu does not regard this as a good operation, and believes that 18 months is too soon to judge of its ultimate results. Graefe[5] reports a case of total prolapsus in which he was compelled to perform an extirpation owing to his inability to replace the uterus within the pelvis. In 4 weeks' time there followed a considerable prolapse of the anterior vaginal wall, and Fehling believes that in these cases the total extirpation should be supplemented by an anterior and posterior kolporrhaphy.

Baldy[6] describes a new operation for uterine prolapse (Plate 3). The procedure is in all essentials an abdominal hysterectomy by amputation at or below the internal os. The points to be observed are—to include both the ovarian arteries and the round ligament in the first ligature on each side of the uterus; to place this ligature as near the pelvic wall as possible, so as to leave but a

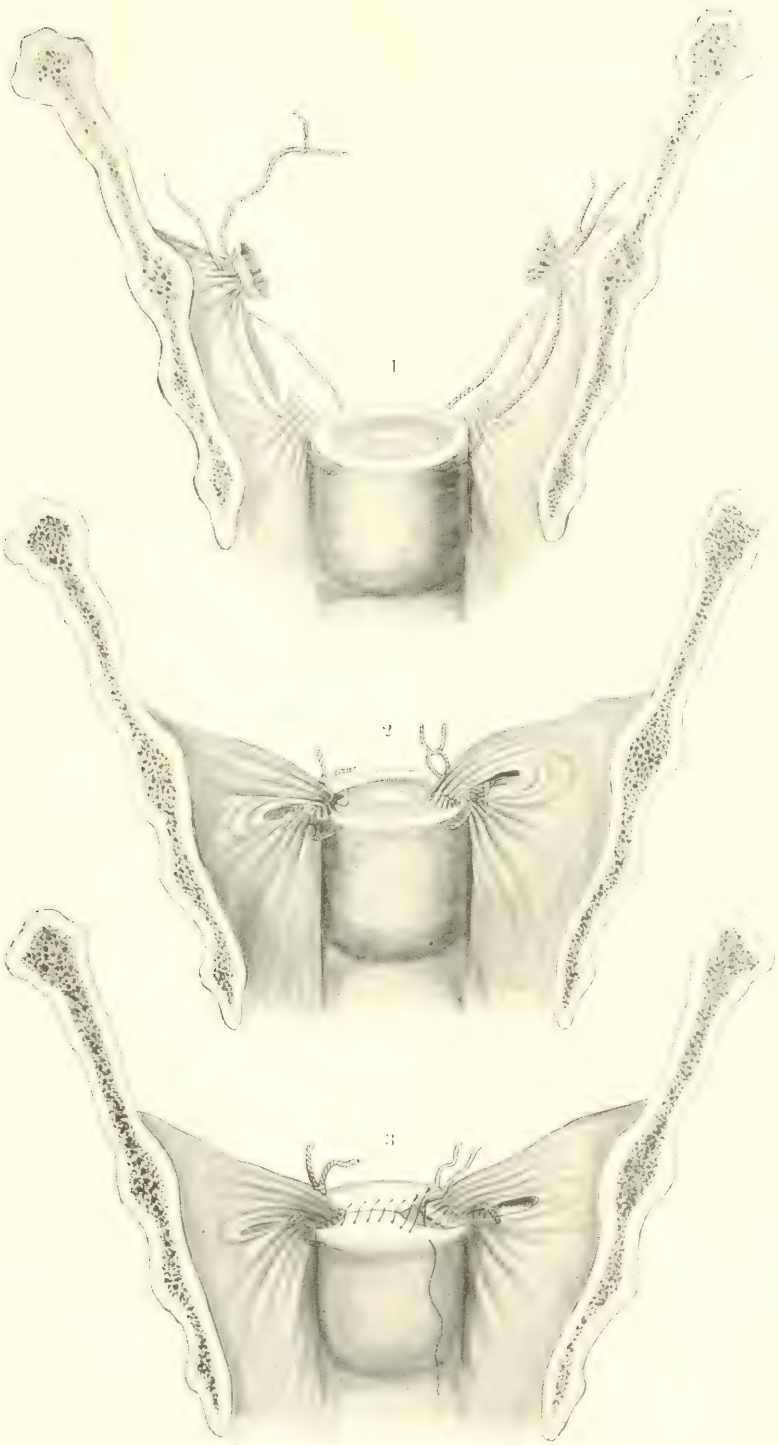
[1] Birmingh. Med. Rev., Sept., 1895.
[2] Arch. f. Gynäk., Bd. i. H. 2, 1896.
[3] Centralbl. f. Gynäk., 1895, No. 22.
[4] Lyon méd., lxxix., 1895, p. 154.
[5] Münch. med. Woch., 1895, No. 11.
[6] Am. Jour. Obst., vol. xxxiii. No. 4, 1896.

small amount of broad ligament behind with the stump; to place but one other ligature on each side of the uterus, this ligature to include the uterine artery with as little other tissue as possible: this leaves both broad ligaments open; to amputate the uterus as low on the cervix as possible. Plate 3, Fig. 1, shows this part of the operation completed, together with the second step—namely, the placing of the sutures. A glance at this illustration shows the suture *in situ*, while inspection of Plate 3, Fig. 2, shows the suture tied with the parts drawn into place. The suture should be composed of heavy ligature silk, and in the course of its application it includes both the ovarian and uterine stumps, *deeply* placed well *back* of the ligatures. It will further be noted that the sutures include the sides of the cervical stump. It can readily be seen that the effect of tying these sutures is to lift up the stump of the cervix together with the vagina, and to bring it in close approximation with the ovarian stumps, doubling the opened broad ligaments together (see Plate 3, Fig. 2). Adhesions take place throughout the full extent of the doubled broad ligament, and most surprisingly firm support is given from above to the vagina. Plate 3, Fig. 3, shows the peritoneum drawn together by a catgut suture over that portion of the cervical stump that remains uncovered after the two sutures are tied. The results accomplished by this operation are as follows: The weight of the heavy uterus is removed; the overstretched vagina is lifted high up and held firmly in place; the supports utilized are the natural supports of the uterus and upper portion of the vagina—the broad ligaments; the cervix remains a pelvic organ, as is natural to it. The immediate and remote result, as regards fixation of the upper part of the vagina, is perfect. The plastic operations on the vagina Baldy judges to be absolutely essential as an adjunct to this as well as to any other similar procedure. He has performed this operation in 8 cases with the most satisfactory results.

Retrodisplacement of the Uterus.—By retroposition—or retrocession, as he prefers to call it—Jarman[1] means that the uterus has receded toward the sacrum without any turning around on its transverse axis. He has observed 62 cases with this displacement. Retrocession of the uterus is due to chronic inflammation and consequent shortening of the uterosacral ligaments; and as a result of this the organ is drawn backward and upward, so that it lies nearer the brim of the pelvis than before, and the ligaments can easily be felt as tender, firm bands running from the cervix toward the sacrum. Uterine mobility is lessened and tension on the cervix causes pain. Pain in the sacral and lumbar regions is the most constant symptom, and this pain is increased on standing or by constriction of the waist with tight clothing. Any attempt to move the uterus will cause pain, which is referred to the back; the normal motility of the uterus is distinctly impaired. Nonoperative treatment must be prolonged if it is going to give satisfactory results. If any morbid condition of the cervix exists, it should be treated, and an effort made to lift up the uterus and so lessen the strain on the uterosacral ligaments. This may be done by means of a tampon or pessary. Jarman has not seen any good

[1] Am. Jour. Med. Sci., Nov., 1895.

PLATE 3.



Baldy's operation for prolapsus uteri (from drawings prepared specially for this work).

results from hot douches in these cases. From time to time an attempt should be made to stretch these ligaments by traction made on the cervix with a volsella, the examining finger being placed meanwhile in the posterior vaginal fornix. The internal administration of red iodid of mercury appears to assist in the cure. If local treatment does not succeed, the uterosacral ligaments should be divided. This can be done easily and safely by making a transverse incision through the posterior fornix so as to lay open the pouch of Douglas. If traction be now made upon the cervix, the ligaments are rendered tense, and can be divided without difficulty by means of a pair of blunt-pointed scissors. The incision is then closed by sutures. Jarman's conclusions are: 1. Retrocession has been often overlooked as a cause of pelvic pain; 2. The condition of the uterosacral ligaments must be considered in the treatment of anteflexion; 3. Retrocession can be easily relieved by operative measures if local treatment does not succeed.

[**The operative treatment of retroflexion** still excites much controversy. Suspensio uteri as yet remains the safer and preferable method, although itself attended at times by some objectionable sequelæ. Vaginofixation, while enthusiastically advocated by a limited number of operators, must ever be objectionable for the same reasons that vaginal incision in uterine fibroids or pyosalpinx is—namely, the inability to secure absolute asepsis and the danger of injury to adjacent structures, not to mention the disastrous consequences of this operation upon subsequent pregnancies and labors. Alexander's operation still survives in its often-modified forms, although steadily falling into disuse.] Stocker[1] of Lucerne has resorted to Alexander's operation 37 times during the past 2 years—1. In 22 cases with mobile retroversions or retroflexions; 2. In 10 cases with retroversion complicated by slight uterine fixation; 3. For prolapse as a single operation in 2 cases; 4. For prolapsus uteri combined with perineorrhaphy in 3 cases. The cases in which the backward-displaced uterus was mobile gave excellent results. With partial fixation of the uterus a recurrence took place in 3 cases. In the other 7 cases the adhesions were more marked and could not be ignored; 2 of these did well. The 5 others were treated by a combined Schultz-Alexander operation, and resulted in a good but somewhat fixed anteversion. The 3 cases in which a combined perineorrhaphy and Alexander's operation was performed gave good results. At intervals of 6 months, a year, and 18 months after operation, respectively, each showed the uterus in place and anteverted. Stocker concludes that Alexander's operation, of all operative procedures, restores the uterus to its normal physiologic position and is attended with no danger.

Mundé,[2] the first to do Alexander's operation in this country, as the result of his experience in 97 cases with 87 permanently cured gives the following clearly drawn indications: 1. Retroversion or retroflexion of the uterus of long standing, in which pessaries either do not maintain the uterus in position, are not retained, or cause pain. 2. Retroversion or retroflexion of long standing, associated with relaxation of the uterine supports (ligaments, pelvic floor,

[1] Cor.-Bl. f. schweiz. Aerzte, Dec. 15, 1895. [2] Med. News, Mar. 14, 1896.

and vaginal walls), and consequent greater or lesser *descensus uteri*. 3. *Prolapsus uteri et vaginæ*, in which the Alexander operation is preceded at the same sitting by trachelorrhaphy or amputation of the cervix, and is followed by anterior and posterior kolporrhaphy and perineorrhaphy. 4. The desire of the patient to be *cured* of her displacement—a wish which no pessary or other nonoperative treatment can fulfil. 5. The necessity for keeping the uterus in its normal anteverted and elevated position after the adherent fundus and appendages have been loosened and restored to their normal mobility, either by bimanual tearing of the adhesions or by peeling the organs loose with the fingers through an incision in the posterior vaginal pouch and Douglas's culdesac.

The *contraindications* to the operation are: 1. Adhesion of the uterus or of the appendages. 2. The possibility of retaining the uterus and appendages in a normal position, and of making the patient perfectly comfortable with a pessary, unless, of course, the patient insists on a *cure*, as already mentioned. 3. *Prolapsus uteri et vaginæ*, unless the plastic operations referred to (anterior and posterior kolporrhaphy and perineorrhaphy, and reduction of the weight of the uterus by trachelorrhaphy or amputation of the cervix) are performed at the same sitting.

H. T. Byford[1] says: In cases without adhesions in which we can replace the uterus Alexander's operation affords brilliant results in competent hands, even when the ligaments are small or cannot be found by the novice. In cases of retroversion with adhesions and decided symptoms it is necessary to open the abdomen to separate the adherent surfaces, and it is then simpler, and perhaps safer, to stitch the fundus forward. In cases of retroversion without adhesion and in connection with sterility, or in cases after the change of life and in which other operations upon the vagina are undertaken, vaginal fixation is often the quickest and easiest procedure, and will undoubtedly find a small place in gynecologic surgery. With regard to pessaries, these are useful in cases of retroversion with adhesions in which the uterine pathologic conditions may be expected to subside within a reasonable time, and it will then make but little difference whether the uterus is retroverted or not. [This statement is open to very serious criticism, since retroversion at any age and under any circumstances is productive of the most distressing train of clinical manifestations.]

In cases of **adherent retroposed uteri** Pryor[2] operates from the vagina. The uterus is thoroughly curetted, and, if there be hypertrophy of the cervix, Schröder's amputation is also done. Douglas's culdesac is then opened, and existing adhesions are broken up by the fingers. A large iodoformized pad, to which is attached a string, is introduced into the pelvis and the patient thrown into Trendelenburg's position; the intestines gravitate into the abdominal cavity, and another pad, similar to the first one, is introduced. The table is then lowered, and the uterus is pushed up behind the symphysis by the Péan trowel. The adnexa may then be examined; the uterus is packed

[1] Medicine, Feb., 1896.

[2] Med. Rec., July 20, 1895.

with iodoform-gauze; the pads in the pelvis are withdrawn, and a wad of iodoform-gauze inserted into the vaginal opening *just within the cut edges;* the vagina is packed. The lower pieces of gauze are changed on the third day, and the uterine gauze also; the wad of gauze in the culdesac is not disturbed for from 7 to 10 days. The vagina is kept packed to support the uterus for a month. A similar procedure is recommended by Tucker.[1] [These operations are open to the objections common to all forms of major vaginal surgery, repeated mention of which has already been made in these pages.]

Anterior kolpotomy (anterior kolpohysteropexy) is regarded by Madlener[2] as the most important of recent gynecologic operations: it is of service in retrodisplacements of the uterus and also in removing the appendages. Its introduction and popularity are associated with the names of Doyen, Sänger, Zweifel, Mackenrodt, and Dührssen, the last-named having done most to perfect the technic. Anterior kolpotomy is really the name of a group of operations that have in common the incision of the anterior vaginal wall, either transverse or sagittal, and the separation of the bladder from the anterior uterine wall and access to the peritoneal cavity. The opening of the peritoneal cavity is not necessary in every case. The peritoneal fold between the uterus and bladder reaches to a lower point in some patients than in others. In some it descends to a level with the internal os uteri, and in others to a point higher up. Most operators open the peritoneal cavity in performing vaginofixation. By this method (vaginal celiotomy) the fundus may be drawn into the incision between the bladder and uterus, and the ovaries and tubes brought into view. Madlener has operated by this method 43 times, with satisfactory results in every case. The sagittal incision was used in all but 2 cases; the advantages claimed for this method are that the hemorrhage is less and more room is made than by the transverse incision. He used this method 18 times in movable retrodisplacements of the uterus; in 4 of these cases there was vaginal prolapse, and in 1 case there was total prolapse of the uterus; 7 times in retroversion with adhesions, 13 times for retrodisplacements with diseased ovaries and tubes, and 4 times for uterine myomata. Of the last 41 abdominal sections performed for the removal of diseased appendages, 14 were suppurative. Of this number, about one-sixth might have been done by kolpotomy. It is claimed that this operation gives access to the pelvic organs by a way less dangerous than by abdominal section, thus facilitating intraperitoneal operations. There is an absolute certainty of no hernia. Werder[3] remarks that the indications for vaginal celiotomy or the intraperitoneal methods of vaginal fixation may be placed on the same level with ventrofixation. Its advantages, he says, over the latter operation are the avoidance of an external incision, less danger of septic infection (?), shorter and smoother convalescence, fewer sequelæ, and absence of the distressing symptoms noted after abdominal section (intense thirst and flatulence). The only contraindication to the operation is a very narrow vagina.

[1] N. Y. Polyclinic, vol. vi. No. 5, p. 338. [2] Münch. med. Woch., Nov. 5, 1895.
[3] Jour. Am. Med. Assoc., Aug. 24, 1895.

Wendeler[1] in reporting upon anterior kolpotomy and its results in A. Martin's clinic gives the operative technic as follows: The patient is placed in the dorsal position with the legs raised on either side. A speculum being introduced, the uterus is fixed with a pair of Orthmann's forceps, a combination of uterine probe and volsella, which grasps the anterior lip of the cervix, so that it can be drawn to the vaginal introitus. Another pair of volsella forceps is fastened just under the orifice of the urethra about 3 in. from the cervical opening. The anterior vaginal wall is pulled upward; a fold is raised which is incised vertically and peeled off laterally from the surface of the bladder and cervical body. Hard fibers will be seen above the vaginal insertion, and these are to be divided. The upper border is then pushed upward, separating the loose tissue between the bladder and uterus, thus carrying the former out of the way. The peritoneum is found as a fold between the bladder and the uterus; this is to be opened, when the abdominal cavity and contents are exposed to view. Further operative procedures are to be carried on according to the requirements of the case. Myomatous tumors can be removed, wherever they are situated, by simple excision or by morcellement. Movable retroflexed uteri can be easily replaced, and retained by vaginal fixation. Peritoneal adhesions fixing the uterus are broken up by the finger. Cystic ovarian tumors can be opened and brought outside, so as to expose the pedicle for proper ligation. When the uterus is drawn downward and forward the ovaries and tubes follow as soon as they are freed from adhesions. Anterior kolpotomy, he claims, offers great advantages in treating diseases of the tubes. The uterus and adnexa are to be replaced in the abdominal cavity by pressing on the anterior uterine surface. A strong catgut suture is to be carried with a curved needle through the upper end of the vaginal wound, the cellular tissue at the base of the bladder, the peritoneum, and the anterior uterine wall near the fundus, taking a good hold of it, and out again at the opposite side, and tied. Two other sutures close the vaginal wound, connecting it with the anterior surface of the corpus uteri, and a fourth to the cervix. A running catgut suture is used to close the vaginal wound more exactly. After this method 149 operations were performed; 93 cases suffered from chronic pelvic peritonitis, and in 58 of these the uterus was fixed. Uterine myomata were present in 13 cases, diseases of the adnexa in 18 cases, and other abnormalities of the internal genitalia in 25 cases. During 3 operations the bladder was accidentally injured, each case healing without any disturbance. Secondary hemorrhage was observed 7 times, but the recovery continued uninterrupted. An examination of 87 cases showed complete recovery in all except 9 cases. Wendeler considers the dangers from succeeding pregnancy as trifling if the uterine sutures are placed about 2 cm. below the summit of the fundus.

Vaginofixation still claims some adherents, although Mackenrodt,[2] in consequence of the unfortunate results which have followed pregnancy after vaginofixation, has been led to abandon the operation, in spite of his having

[1] Berl. klin. Woch., No. 2, 1896.

[2] Centralbl. f. Gynäk., 1895, No. 49.

had 90% of successful cases. The uterus is retained in a position of extreme anteflexion by firm adhesions, which do not yield under the influence of pregnancy. He now opens the anterior vaginal fornix by a vertical or transverse incision, pushes up the bladder, opens the vesicouterine fold of peritoneum, and, after excising as much of this membrane as possible, unites the vesical edge to the fundus uteri. The bladder is then reunited to the raw surface in the corpus uteri as low as the os internum, and the vaginal wound is closed. The advantages claimed for this method are fixation of the uterus in a normal position, obliteration of the vesicouterine pouch, preservation of the normal relations of the bladder, and the absence of subsequent vesical and uterine disturbances. The indications for the operation are retroflexion with perfect mobility of the uterus, with or without prolapsus. Ventrofixation should be preferred if the uterus is adherent. Gilbert[1] calls attention to the fact that the operation is not applicable to cases in which it would be necessary to separate firm and extensive adhesions before replacing the uterus; in these cases ventrofixation is indicated. Wertheim[2] asserts that the peritoneal cavity should be opened in every instance, as only in this way is the operation rendered absolutely safe. The criticism that the uterus is fixed in extreme anteversion does not hold, he thinks, as the organ eventually regains its normal mobility. Vesical disturbances, especially from buried sutures, are avoided by using catgut for peritoneal fixation. Vineberg,[3] in order to avoid dystocia after ventral fixation, has devised a new method of performing vaginal fixation, in which, after the usual vaginal incision, the uterus is fixed by Olshausen's method (suturing the round ligaments and a portion of the broad ligament instead of the uterine fundus). The ultimate results are not stated. Byford[4] does the same operation, but includes fixation of the fundus uteri, since he believes that the peritoneal adhesions alone will not suffice to hold the uterus in place. Jacobs[5] punctured the bladder in performing vaginal fixation; and this is one of the possible accidents of the operation. Vineberg[6] has performed vaginofixation 48 times. In the last 28 cases the percentage of cures was 100.

Vineberg,[7] who is an enthusiastic advocate of this operation, records 48 cases in which he has employed it with 8 relapses. Four subsequently became pregnant; 1 induced abortion; 2 went to full term and had easy labors. A vertical incision is first made through the mucosa in the median line from the vesical neck to the cervix. The bladder is then separated transversely with the finger from the uterus until the peritoneum is reached. After the peritoneal fold has either been torn through with the finger or cut with the scissors, the volsellæ applied to the cervix to draw it to the vulva are then made to push it backward into the posterior fornix of the vagina. This step at once throws the body somewhat forward. Then, either with successive volsellæ or

[1] St. Petersburger med. Woch., 1895, No. 22.
[2] Centralbl. f. Gynäk., 1895, No. 18.
[3] Am. Gyn. and Obst. Jour., June, 1896.
[4] Ibid.
[5] Arch. de Tocol. et de Gynéc., Feb., 1895.
[6] N. Y. Med. Jour., Mar. 7, 1896.
[7] Ibid.

traction-sutures (preferably the latter, as they are not so likely to tear out), he proceeds up the anterior surface of the uterus until the fundus is reached, and it is brought entirely through the vaginal incision. The whole uterus now presents at the vulvar opening. Its anterior and posterior surfaces are rapidly scanned for any pathologic growth. Then with two fingers the adnexa of one side are brought out through the incision. The ease or difficulty attending this procedure depends upon the extent and firmness of the adhesions existing between the adnexa and the pelvic wall and floor. After they are drawn out they can be treated on conservative surgical principles, with the same facility as by the abdominal route. When the tube and ovary are hopelessly diseased, they are tied, as in the abdominal method, and ablated. The tube and ovary of the other side are then drawn out and treated in the same manner. Two or 3 silk sutures are then carried across the anterior surface of the uterus about a centimeter apart, the superior one being passed about 1 cm. below the level of the insertion of the tubes. The next step consists in returning the uterus (the adnexa having been returned before) into the pelvic cavity. This may sometimes be accompanied by considerable difficulty, but is aided by catching the cervix with a volsella and drawing it forcibly into the position in which it was held at the beginning of the operation, by pressing the fundus with the fingers backward and downward. The fixation-sutures are next carried through the vaginal flaps by means of a carrying suture. Before this, however, the anterior surface of the uterus between the sutures has been scarified as in ventrofixation. [This step is the most obnoxious feature in any form of vaginofixation, resulting as it of necessity must in such firm union between the uterus and tissues in front of that organ that vesical symptoms and gestational troubles almost invariably follow.] The same author[1] believes that vaginofixation is indicated in all backward displacements of the uterus, with or without adhesions and with or without diseases of the adnexa, in which surgical interference, for one reason or another, is demanded. It is particularly indicated, he claims, when the backward displacement is complicated by moderate prolapsus of the uterus and prolapsus of the anterior vaginal wall. It finds an undisputed field in very fat subjects with thick abdominal walls, in whom a ventral fixation constitutes a serious affair, and in whom an Alexander operation is extremely difficult of accomplishment. The same holds good in very thin subjects with thin and yielding abdominal parietes, so far, at least, as ventral fixation is concerned. The operation can be performed in multiparæ and even in virgins. It is contraindicated in certain cases of congenital retroversion. It should not be undertaken until a certain period has elapsed after the puerperal process, as the soft and friable condition of the uterus may lead to undesirable laceration in the necessary manipulations to bring about anteversion of the organ. He urges that not enough stress has been laid on the large percentage of failures and the mortality following Alexander's operation, or upon the frequency with which it was followed by hernia.

In a paper read by Dührssen[2] at a meeting of the Berlin Gynecological

[1] Med. News, Mar. 14, 1896.

[2] Centralbl. f. Gynäk., No. 7, 1896.

Society, Jan. 10, 1896, the author points out the objections to the method of intraperitoneal ventrofixation in which the whole anterior uterine wall is sutured to a longitudinal incision in the anterior fornix vaginæ. Instead of this, he advocates a transverse incision, to which he sutures the plica vesicæ, while the uterus is united to the peritoneum of the plica. By this method the uterus, although only fixed by peritoneal adhesions, remains in a normal position and retains almost normal mobility. The dislocation of the bladder consists in a slight anterior displacement. A kinking of the Fallopian tubes does not occur: this is proved by the numerous subsequent pregnancies. Dührssen observed after vaginofixation without opening of the peritoneum 28 pregnancies and 17 normal confinements. These cases prior to operation were either sterile or had repeated miscarriages. He knows of 17 pregnancies following *intraperitoneal vaginofixation;* of these, 1 woman aborted spontaneously, while in another case pregnancy was artificially interrupted; 7 women were delivered at term without aid, and in 4 others labor was complicated. One of these cases has been reported by Strassmann; in this case the union between uterus and vagina, a result of faulty technic, was abnormally firm. In a second case the forceps was applied on account of insufficient dilatation. It is questionable whether this was the fault of the vaginofixation. The 2 remaining cases necessitated version, because the os was high above the innominate line and did not dilate. This complication has also been observed after ventrofixation, and can be avoided by obtaining only a peritoneal union between the plica vesicæ and the uterus. If the os does not dilate in spite of good pains, dilatation with the colpeurynter and combined version are indicated. *In exceptional cases vaginal Cesarean section must be performed*, the technic of which consists of a T-shaped incision into the anterior fornix of the vagina, separation of the vagina from the bladder and of the bladder from the cervix; next the plica vesicæ is pushed upward and the cervix and corpus uteri are divided sufficiently to permit of the extraction of the child. The wounds are afterward united. [In these grave circumstances Cesarean section performed in the usual manner is much to be preferred to the foregoing suggestion, both on account of the ease and rapidity of performance and because of the diminished risk of sepsis.] Dührssen has performed 148 intraperitoneal vaginofixations, with only 1 death and 1 relapse.

Literature is accumulating as to the ultimate outcome of **hysteropexy.** Mackenrodt[1] was compelled to remove the uterus from a woman who had undergone hysteropexy for prolapse about a year previously. Dragging and tearing pains were felt constantly, being referred to the site of adhesion of the fundus to the parietes, and the patient became more of an invalid than before the operation; hence the necessity for the excision of the organ. Baldy[2] also was compelled to perform hysterectomy on a patient upon whom hysteropexy had been performed 1 year previously. Garceau[3] reports a fatal case of pulmonary infarction occurring 6 days after hysteropexy, with thrombosis of the

[1] Centralbl. f. Gynäk., No. 28, 1895. [2] Am. Jour. Obst., vol. xxxiii. No. 4, 1896.
[3] Boston M. and S. Jour., Dec. 19, 1895.

left iliac vein. Goubaroff[1] was compelled to deliver by Cesarean section a patient on whom Küstner had performed hysteropexy 4 years previously. The abdominal cicatrix was found closely adherent to the anterior surface of the uterus, which bore a depression on its fundus. The cervix was so high up that it could not be reached without the aid of anesthesia. The upper part of the vagina was contracted and the os completely closed. The left shoulder presented. As a rule, it is claimed that hysteropexy adhesions break down during pregnancy. Kelly[2] in an article based on a series of 200 operations states that there have been at least 6 pregnancies, in only 1 of which was there any marked discomfort and dragging due to the attachments of the womb. Baldy[3] cites 2 cases, both having easy confinements. Gottschalk[4] mentions 2 cases in which the pain was unduly severe. Mackenrodt[5] reports a case of difficult labor, and Michaelis[6] 1 case.

Léon[7] writes that the results of abdominal hysteropexy as shown in the paper published by Laroyenne—namely, that pregnancy occurring after this operation is usually followed by abortion—are due to faulty technic in the method of placing the sutures between the abdominal wall and the uterus. Léon gives the following rules to be observed in this operation: 1. The sutures should not be removed; 2. The number of sutures should be sufficient; 3. The sutures should be placed through the anterior wall of the uterus and not the fundus; 4. The sutures should include sufficient tissue, at least 0.5 cm. From the observations of Laroyenne and the greater number of French surgeons the adopted technic of the operation does not allow the physiologic growth of the uterus during pregnancy, and, besides, the adhesions are not firm enough. Of 60 cases operated upon by Laroyenne, 3 became pregnant; of these 1 proceeded to full term and 2 aborted in the first month. The writer believes that abortion in these cases was induced early in pregnancy because the fundus and not the anterior uterine wall was sutured. [The author is undoubtedly correct in ascribing the troubles noted after hysteropexy largely to some defect in technic. The proper operation is a *suspension* of the uterus by the peritoneal covering of the fundus, and not a true and firm fixation of that organ to the anterior abdominal wall.]

Edebohls,[8] from a study of ventral fixation concludes that—1. Vaginal fixation does not come within the sphere of legitimate operations in women liable to future pregnancy. 2. The indications for ventral fixation of the uterus should be limited to the utmost degree in women liable to subsequent pregnancy. 3. Ventral fixation is never indicated in uncomplicated retroversion of the uterus. 4. Inability of an operator to perform shortening of the round ligaments *may* be an indication for ventral fixation, but not in the case of one claiming to be a specialist in gynecology. 5. Ventral fixation is indicated, *as an adjuvant*, in the performance of combined operations for pro-

[1] Arch. de Tocol. et de Gynéc., Nov., 1895.
[2] Jour. Am. Med. Assoc., Dec. 21, 1895.
[3] Trans. Coll. of Phys. of Phila.
[4] Centralbl. f. Gynäk., 1895, No. 52.
[5] Monatsh. f. Geburtsh. u. Gyn., 1895, ii. No. 5.
[6] Am. Med.-Surg. Bull., Mar. 14, 1896.
[7] Prov. méd., No. 6, 1895.
[8] Med. News, Mar. 14, 1896.

lapsus uteri et vaginæ. 6. Ventral fixation is indicated as a closing step in all abdominal sections in which the adnexa are removed and the uterus is left. 7. Ventral fixation *may* be indicated, under exceptional conditions, in cases of adherent retroversion with tubes and ovaries in good condition. 8. Ventral fixation *may* be indicated in the most aggravated cases of uncomplicated sharp retroflexion: the writer has not met such a case not amenable to successful treatment by shortening the round ligaments. 9. Ventral fixation is indicated, under certain conditions, in cases of uterus unicornis. Leopold,[1] during a discussion at the Dresden Gynecological Society, took occasion to criticise vaginofixation of the uterus, and instead recommends ventrofixation. He performed the latter operation in 73 cases, and has never seen serious complications during pregnancy or labor. The evil results observed after ventrofixation he ascribes to faulty technic and a fixation of the uterus at the level of the umbilicus or immediately above the bladder, or that the fundus plus posterior uterine wall was fixed to the abdomen, or that the sutures consisted of nonabsorbable material. The proper technic consists in fixing the uterus about 1 in. above the symphysis, and the sutures, two in number, should be passed through the anterior and upper portion of the corpus uteri. Leopold also performed 8 Alexander operations, and, although he experienced no difficulty in finding the round ligaments and placing the uterus in a normal position, he found that the patients frequently complained of pain in walking and in the inguinal canal, and he also observed that the healing of the wounds was often protracted.

In comparing ventrofixation and Alexander's operation Smith[2] remarks that the former has some great advantages—namely, it can be employed in cases in which the ovaries and tubes are adherent; also, patients complain of pain and numbness of the groin and labia after Alexander's operation, due to the severing of the nerve running along the round ligament, which is not noted after ventrofixation.

Fowler[3] suggests a new method of performing hysterorrhaphy, in which the uterus is secured to the anterior abdominal wall by means of the urachus. The superior ligament of the bladder extends from its summit to the umbilicus and encloses the obliterated urachus and hypogastric vessels. It is narrowest at the umbilicus. The usual abdominal incision is made and the urachus identified; its upper extremity is cut across, and the cord, together with a ribbon of peritoneum 1 cm. wide, is detached down to the level of the lower angle of the wound. The uterus is next brought into position, and a Cleveland ligature-carrier is passed beneath its serous and subserous coats at a point on its posterior wall near the junction of fundus and posterior wall. The ribbon of peritoneum and urachus is then drawn into the opening, where it remains fixed; the portion over and above what is required is restored to its normal position and secured by stitches. The operation is quickly performed.

[1] Centralbl. f. Gynäk., No. 6, 1896.

[2] Am. Jour. Obst., Aug., 1895.

[3] N. Y. Med. Jour., Oct. 5, 1895.

FIBROID TUMOR OF THE UTERUS.

Borissoff[1] has made investigations upon 21 uteri in order to ascertain, if possible, the cause of the frequent and obstinate **hemorrhages that are associated with fibroid tumors.** Wyder in 1878 first announced that the endometrium was converted into diffuse adenoma, and in 1887 he reported 20 cases in which he found interstitial endometritis. Campe found in 10 cases chronic glandular endometritis with inflammatory changes in the stroma-tissue in 1 case. Schmal in 1891, from the investigation of 15 cases, concluded that atrophy of the endometrium occurred over the tumor and hypertrophy distant from the tumor. Finally, Semb, with 23 cases, stated that no definitely characteristic changes could be determined. The results of Borissoff's microscopic examinations were as follows: In the endometrium removed from the site of the tumor there was atrophy with complete or partial destruction of the glands in 11, glandular endometritis in 3, interstitial endometritis in 5, and glandular and interstitial endometritis associated in 2 instances. In 13 uteri it was possible to remove a portion of the tumor-wall with the endometrium. In these sections an atrophic change was seen in 7, glandular endometritis not at all, interstitial endometritis in 3, and glandular and interstitial endometritis in 3 cases. The most pronounced change was always seen in those cases in which there was an interstitial tumor. In 2 cases of subperitoneal tumor the entire endometrium had atrophied, and in another there was glandular and interstitial endometritis. In many of the preparations every form of endometritis was to be seen. As regards the hemorrhage, the following order was observed: Where there was menorrhagia, 2 cases, glandular endometritis was found in 1, and glandular and interstitial endometritis in the other. Where there was metrorrhagia, 11 cases, atrophy of the endometrium was found in 7, glandular endometritis in 1, interstitial endometritis with beginning sclerotic change in 2, and glandular and interstitial endometritis in 1. It was particularly noticed in the greater number of microscopic sections that beneath the superficial portions of the endometrium the blood-vessels were very much dilated and filled with corpuscles. This condition extended to the surface, where there was an atrophic change. Besides this, a diffuse extravasation of blood was seen in all sections, most marked in the superficial endometrium, but sometimes extending into the muscular wall. In most of the sections the superficial epithelial cells had disappeared. Borissoff concludes that the hemorrhage results as follows: When the tumor reaches a palpable size a hyperemia of the uterine body occurs that sometimes results in a parenchymatous inflammation not unlike that seen in the ovary as described by Popoff and others. This first causes the menorrhagia that usually appears before the tumor is diagnosed. As the tumor increases in size the circulation is more and more obstructed in the uterine wall and endometrium, as shown in the description of the microscopic sections. Under the influence of the circulatory obstruction the menorrhagia becomes progressively more profuse and persistent. As

[1] Monatsh. f. Geburtsh. u. Gynäk., 1895, B. ii. H. 5.

a further result of the obstruction the blood-vessels undergo structural change because of the increased blood-pressure or fatty degeneration, and they rupture. At this time the hemorrhages become most frequent, persistent, and severe, often requiring treatment. The extravasation of blood from the overfilled or degenerated blood-vessels of the endometrium causes the destruction of the superficial endometrium and allows the blood to escape into the uterine cavity. The extravasation of blood also explains the blood-tinged watery discharge so often seen. The increased size of the uterine cavity, necessitating a wider area of diseased endometrium, also helps to explain the hemorrhage. Why it is that in a few cases of interstitial fibroid tumor the menstrual flow is normal or absent is difficult to determine. Borissoff believes there is here some associated condition preventing hemorrhage, as disease of the ovaries, general anemia, insufficient circulatory development, or a misplaced uterus.

Ott[1] has operated upon a woman 34 years of age, whose ovaries Lebedeff had removed 3 years previously for a retrocervical fibroid. After temporary atrophy the tumor grew larger than ever, and caused acute pain. On opening the abdominal cavity Ott found the uterus as high as the umbilicus on the top of a large and entirely subperitoneal tumor. The uterus was removed first, then the tumor, the latter operation proving very difficult. Compression of the aorta and plugging of the capsule, which was fixed to the abdominal wound, checked the hemorrhage. The capsule suppurated, but the patient recovered for a while, a fistulous track remaining. Bad symptoms set in again, and a soft mass was detected at the bottom of the fistula, which on microscopic examination was found to be sarcomatous, though the large tumor seemed an ordinary fibroid. The malignant deposit speedily became diffused. In a second case a large uterine fibroid was removed, but a mass which seemed simply fatty was left in the broad ligament. On cutting into the fibroid after its amputation a sarcomatous mass was discovered in its interior. Ott observes that the diagnosis of *sarcomatous degeneration of a uterine fibroid* is not easy; the condition may even be overlooked at the time of operation.

Ricker[2] has made researches in order to throw light on the true origin of uterine fibroids. He does not support the opinion of Kleinwächter and others that the muscle-cells in a myoma were originally discarded, so to speak, from arterioles subsequently blocked. There is strong reason to believe that myoma has usually an embryonic origin. In certain cases very distinct epithelial relics are found in myoma. These seem to represent remains of the primitive epithelium of Müller's duct. Relics of the Wolffian duct are decidedly to be found in the uterine wall; in fact, Ricker seems as certain as Coblenz as to the persistence of this duct and its relation to new growths. Abnormal ingrowths of muscle-cells around the duct are represented in Ricker's drawings. Hence it is probable that every myoma originally arises from some abnormal growth of muscle around the Wolffian duct in the uterine wall or around epithelial débris from the Müllerian duct-relics, which may even be

[1] Ann. de Gynéc. et d'Obstét., Dec., 1895.

[2] Virchow's Archiv, vol. cxlii. part 2, Nov., 1895.

distinct diverticula not entirely effaced after the fusion of that duct with its fellow to form the uterus. Ricker notes that, on *a priori* reasoning, carcinomatous changes in a myoma ought not to be rare, since epithelial elements originally form an essential part of that new growth. Yet he admits that not a single authentic case of carcinomatous degeneration of a myoma has ever been recorded. Sarcomatous changes have been detected by good authorities, but so rarely that a uterine "fibroid" is practically as innocent as a true fibroma developed in any part of the body.

Treatment of Fibroid Tumors.—The operation of Gottschalk and Martin has not given brilliant results. Kuhn[1] states that in 6 operations by Howitz only 1 was successful, on account of the youth of the patients and the size of the tumors. The operation, it must be admitted, is attended with but a minimum of danger, but its application is limited to tumors that are soft, bleeding, and of minimum size. It is not applicable to very large, hard tumors, to those that are within the broad ligament, nor to those that are of considerable size.

[Battey's operation is still of service in a certain proportion of cases, and when other more radical procedures are not permitted it may prove beneficial, provided there do not exist any contraindication to its performance. It is, however, an operation that is rarely performed.] Johnson[2] has performed the operation in 34 instances for fibroid tumors, and all but 1 of the cases have been successful, so far as arrest of hemorrhage and cessation of growth were concerned. Dorland has done the operation in 1 case within the year, with the result of arresting the growth of the tumor, but not completely checking the hemorrhage. Recent investigations have shown that the menopause, either normal or induced, has not such a decided influence upon these tumors as was formerly believed. Johnson[3] believes that the average failures of the operation amount to about 10%.

Obalinski[4] of Warsaw considers the enucleation of the fibroid growth with conservation of the uterus as the ideal method. He recommends a new method of operating, which he terms *organo-pexil*. His technic is as follows: When the tumor is pedunculated the pedicle is cut in the form of a cone, and the peritoneal flaps thus formed are united by a suture. When the growth is interstitial he makes a longitudinal incision in the wall of the uterus and extirpates it bluntly with the finger and handle of the scalpel. The blood-vessels are caught and tied. The uterine wound is sutured at its depth, and is then sewn to the abdominal wound. Several strips of gauze are passed in the lower angle of the wound down to the uterus, the wound of the abdominal incision being closed in the usual way. He has operated in this way in 4 cases with complete success.

As to the relative value of supravaginal hysterectomy and complete or total removal of the uterus opinions differ. Ashton[5] remarks that the selec-

[1] Nordiskt med. Arkiv., Aug., 1895.
[2] Va. Med. Monthly, Jan., 1896.
[3] Loc. cit.
[4] Przeglad Chirurgiczny, tome 2, zezeit 2, 1894.
[5] N. Y. Med. Jour., Feb. 1, 1896.

tion of either one of these operations depends upon the indications in a given case. For example, total hysterectomy is indicated in sloughing fibroids with general infection of the uterus, or when malignant disease is associated with the neoplasm. On the other hand, supravaginal hysterectomy is the preferable operation when these conditions are absent, since it is impossible to render the vagina aseptic; and, again, the vaginal vault is better preserved when the cervix is left intact, and thereby sexual intercourse is not interfered with.

Removal of the uterus and appendages by continuous incision, as first proposed by Pryor several years ago, has been done by Kelly [1] in upward of 200 cases. The operation consists in the following steps: 1. Opening the abdomen. 2. Ligation of the ovarian vessels near the pelvic brim, either on the right or on the left side, clamping them toward the uterus, and cutting between. 3. Ligating the round ligament of the same side near the uterus, cutting it free, and connecting the two incisions, in order to open up the top of the broad ligament. 4. Incision through the vesicouterine peritoneum from the severed round ligament across to its fellow, freeing the bladder, which is now pushed down with a sponge, so as to expose the supravaginal cervix. 5. Pulling the body of the uterus to the opposite side to expose the uterine artery low down on the side opened up. The vaginal portion of the cervix is located with thumb and forefinger, and the uterine artery, seen or felt, is tied just where it leaves the uterus: it is not always necessary to tie the veins. 6. The cervix is now cut completely across just above the vaginal vault, severing the body of the uterus from the cervical stump, which is left below to close the vault. 7. As the last fibers of the cervix are severed or pulled apart, while the body of the uterus is being drawn up and rolled out in the opposite direction, the other uterine artery comes into view and is caught with artery-forceps about an inch above the cervical stump. 8. Rolling the uterine body still farther out, the right round ligament is clamped and cut off, and lastly the ovarian vessels are clamped at the pelvic brim, and the removal of the whole mass, consisting of uterus, tubes, and ovaries, is completed. 9. Ligatures are now applied in place of the forceps, holding the uterine artery, round ligaments, and ovarian vessels; if the surgeon prefers, these may be tied as they are exposed without using forceps. 10. After the enucleation the operation is finished in the usual way, (*a*) by closing the cervical tissue over the cervical canal, and then (*b*) by drawing the peritoneum of the anterior part of the pelvis (vesical peritoneum and anterior layers of the broad ligaments) over the entire wound-area and attaching it to the posterior peritoneum by a continuous catgut suture. The continuous transverse incision should always be started on the side where the ovarian vessels and the ovary and tube are most accessible. If the case is one of a fibroid uterus and the tumors are developed under the pelvic peritoneum or in the broad ligament of one side, this side should be opened up last, from below upward, when the tumors can be rolled up and out with surprising facility. Displaced ureters

[1] Johns Hopkins Bull., Nos. 59, 60.

will not be injured, for on the side on which the enucleation is started such a ureter is pushed down with the loose peritoneum as the uterus and tumors are pulled up and toward the opposite side, and on the other side, no matter how much the ureter is displaced out of the pelvis, as the tumors caught from below are rolled up and out the ureter drops down with the peritoneum and cellular tissue to the pelvic floor, and the operator need not even see it or be aware of its displacement to avoid the risk of injuring it. If the ureter is found to be displaced only on one side, the operation should begin on the opposite side. To escape the danger of tying the ureter in the side on which the uterine artery is caught after dividing the cervix, put the forceps on the artery well above the cervical stump and tie there. The special advantages offered by this method are—1. The saving of from 60 to 80% of the time in the enucleating stage of the operation. 2. The ease with which intraligamentous myomata and myomata beneath the pelvic peritoneum may be enucleated. 3. The ease with which inflammatory masses posterior to the broad ligament may be enucleated by attacking them from below after dividing the cervix. 4. The control of a displaced ureter on the side last opened up, keeping it out of the way of injury by the simple mechanism of the operation. [In unskilled hands the operation is an exceedingly dangerous one and should only be resorted to in the case of intraligamentous fibroid tumors, as was originally done by Pryor, or in very bad pelvic inflammatory cases where the broad ligaments are practically obliterated by the inflammatory products. It should remain most decidedly the method of necessity, not of choice.]

Vaginal Hysterectomy.—Papers on vaginal hysterectomy for pyosalpinx and uterine myomata have been presented by Wathen,[1] Irish,[2] Cushing,[3] and Donald.[4] Irish writes to favor the operation only in cases of extensive pelvic abscess—that is, when the pus is more or less diffuse in the pelvis. In his experience the after-results in patients operated upon by the abdominal method are much superior to those in patients subjected to the vaginal incision; there has been less disturbance, and recovery has been as rapid as after the vaginal method. When clamps are used there is often noted, he claims, abdominal distention and reversed peristalsis, indicating a localized sepsis. Also, the tissue caught in the blades of clamps must slough and come away—a process often occupying 2 or 3 weeks. Cushing claims that freedom from shock, hernia, and scar is the main advantage of the vaginal route, and he asserts that the method is gaining ground, not only in France, but also in New York, Chicago, Pittsburg, and Boston. The disadvantages are the greater amount of skill required and the larger number of instruments needed. He claims that adhesions can be much more readily overcome from below than from above, and, if need be, a little of the uterus may be snipped off and left attached to the bowel; which cannot be done from above unless hysterectomy is to be performed. As to the method of performing *morcellation*, there are three principal ways—Péan's, Müller-Quénu's, and Doyen's.

[1] Am. Jour. Obst., Aug., 1895.
[2] Boston M. and S. Jour., Jan. 23, 1896.
[3] Ibid., Jan. 23, 1896.
[4] Brit. Med. Jour., Feb. 29, 1896.

Péan's original operation is as follows: He makes a circular incision around the cervix, separates the bladder anteriorly and the rectum posteriorly from the uterus, and clamps the lower part of each broad ligament; then he splits up the uterus on each side, and, grasping the anterior portions high up with forceps, he cuts the posterior flap away. When this is removed the uterus can be made to roll a little forward. The bladder may then be dissected away and the anterior culdesac opened; then a narrow speculum, bent at a right angle, is put in, and lifts the bladder out of the way. The operator then cuts off the anterior flap, and pulls it down with forceps on each side of the stump. Then the whole process is repeated. Each time, before cutting laterally, a clamp is laid on the broad ligament, so that there is no bleeding as the uterus comes down. In difficult cases one cannot always get on in that way, and then comes the principle of splitting the anterior flap vertically in the middle. If the uterus is split in the middle anteriorly after the lower portion has been removed, it comes down very much more. The minute the consistency of the uterus is broken by splitting it, each part will come down separately more than the whole organ would do.

The procedure of Quénu is an amplification of that of Müller, who proceeded years ago to split the uterus and tie each ligament separately. Quénu splits the uterus in the median line anteriorly, and extracts the uterus by getting a new hold with volsella forceps as the uterus comes down. He does not do any lateral division of the uterus, but puts on clamps from below upward, removing the lower portion of the cervix as he proceeds.

Almost all of the other operators put the clamps on as follows: One short pair on each side holds the lower part of the broad ligament and prevents all bleeding. When the uterus is brought outside another clamp from above is put downward, externally to the ovary if possible, so as to meet the first one, and if a little blood comes in the middle, it is easy to put a third clamp on. The process of Doyen is to split the uterus anteriorly, and thus to bring the whole uterus outside before he clamps anything, and then he makes a long clamp and puts it on from above downward, trying to get the broad ligament and round ligament, and leaving the ovary and tube on the uterus above; and to prevent it from slipping off he puts a little clamp on the free end of the stump of the broad ligament.

Abdominal Hysterectomy.—Penrose[1] cites some of the dangers attendant upon the presence of a fibroid tumor, including cystic degeneration, inflammation, associated tubal disease, malignant degeneration, pressure-disease of the urinary organs, and the serious effect upon the heart-muscle, which is often overlooked. He states that every abdominal tumor causes an increased vascular pressure, and consequently reacts upon the heart. Hofmeier in 1884 insisted on the frequency of cardiac disease in cases of abdominal tumor, especially with fibromata. He collected 18 cases in which sudden death occurred from heart-failure. In 3 there was fatty degeneration, and in 15 brown atrophy of the heart. Penrose advises hysterectomy in the vast majority of

[1] Univ. Med. Mag., Jan., 1896.

cases of uterine fibroid. Baldy[1] has noticed that a certain proportion of his cases had a profuse and persistent vaginal discharge during convalescence. In abdominal hysterectomy he sutures with a continuous suture the cut edges of the vaginal mucosa, also the connective tissue and peritoneal edges in the same manner, so that all the wound is extraperitoneal, including the stumps of the uterine arteries. In the past all sutures and ligatures he used were of silk. One patient brought him several pieces of silk passed by the vagina after 3 or 4 months of profuse discharge, after which the discharge rapidly ceased. The silk probably became infected from the vagina, as the same silk used elsewhere in the operation remained sterile. The records of 37 cases show 6 with a prolonged discharge and subsequent throwing off of suture or ligature material, followed by a cessation of the discharge. To obviate this, the suture joining the vaginal mucous membrane might be inserted in such a manner as not to pass entirely through the vagina, and thus avoid infection, or an animal suture, quickly absorbable, would be less liable to become infected on that account, or at least would limit the duration of the discharge. For the above reasons Baldy now uses catgut entirely in hysterectomies, except for the ligation of the uterine and ovarian arteries, where silk is used on account of its strength being more reliable. For 1½ years he has used catgut in all abdominal work without observing a single case of infection. It is easy to make catgut sterile, provided not too much strength is required of it; in trying to retain the strength the sterilization is apt to be sacrificed, and in this sort of catgut the infection is apt to occur. Baldy suggests that a piece of each freshly sterilized batch of gut should be placed in culture-media, and thus its safety positively ascertained. He is positive that by its use his patients have had more certain and less tedious recoveries.

[The question of the treatment of the pedicle in myomohysterectomy is now practically determined. The dropping of the pedicle, with the suturing over it of the peritoneal flaps, thereby practically rendering it extraperitoneal, is now the approved method of treatment. There are many aspirants to the honor of having devised this procedure, but it is probable that the credit belongs largely to Carl Schröder of Berlin, who carried the extraperitoneal treatment of the stump to great perfection in technic. His method has been modified in a vast number of ways, but the idea is the same in all.] Goffe[2] claims for this intrapelvic but extraperitoneal treatment of the stump the following points of superiority: 1. It involves the least possible loss of blood; 2. It is easy of execution; 3. It is applicable to every case of fibroid tumor; 4. It requires less time than total extirpation; 5. Convalescence, as a rule, is rapid and free from complication. He reports 15 cases operated upon by this method, with but 1 death, while J. T. Johnson[3] reports 17 cases, with 1 death. H. Treub[4] has performed 100 myomohysterectomies in which the pedicle was embraced by an elastic ligature and buried. First, the ligaments on both sides were ligated down to the cervix, and then the bladder separated from

[1] Am. Jour. Obst., 1895, No. 6.
[2] Ibid., Aug., 1895.
[3] Am. Gynæc. and Obst. Jour., Jan., 1896.
[4] Monatsh. f. Geburtsh. u. Gynäk., II. 3, 1895.

the uterus. After cutting away the tumor the cervical canal was mopped with mercuric chlorid solution by means of absorbent cotton and forceps. He has had 7 deaths, most of which could not be attributed to the method employed.

In 204 cases of hysterectomy A. Martin[1] has tied the ureter twice, with fatal result. The bladder was injured in only 2 instances, this being due to the fact that Martin separates it from below upward before opening the anterior vaginal fornix, the procedure being materially assisted by maintaining upward traction on the uterus. He employs the following technic: The vagina is thoroughly cleansed 24 hours before operation, and is tamponed with sublimated gauze. Immediately beforehand it is scrubbed with soap and water, alcohol, and mercuric chlorid solution. The Trendelenburg posture is not used. After opening the abdomen the growth is lifted out *in toto*, traction being assisted by pressure exerted through the vagina if necessary. In some cases it may only be possible after removing some of the smaller tumors. The broad ligaments are ligated in the usual manner with juniper catgut, one side being completely secured before the opposite ligament is ligated. A Richelôt's clamp is applied to the stumps outside of the ligatures. The uterus is then detached as low as the vaginal attachment, and the vagina is opened posteriorly, preferably by boring into it with the end of a dressing-forceps; the edges of the vaginal wall and the peritoneum of Douglas's pouch are then united by interrupted sutures. The bases of the broad ligaments are sutured to the lateral walls of the vagina in the same manner, the cervix meanwhile being drawn upward with a volsella. Finally, the bladder is dissected off from below, the sutures, which have been previously passed through the anterior wall of the vagina and vesicouterine fold, are tied, and the uterus is removed. The ligatures, which are left long, are drawn down into the vagina and the peritoneal flaps are united. Drainage is not employed. The abdominal wound is then closed. The operation is often completed in 30 minutes or less, and the patients' convalescence is uneventful, so that they are usually discharged at the end of 2 weeks.

MALIGNANT DISEASE OF THE UTERUS.

Sarcoma.—Launen[2] describes a case of that rare neoplasm, sarcoma deciduo-cellulare, in which he diagnosticated the condition by the examination of tissue removed with the curet, and extirpated the uterus successfully a few days later. Seven months after the operation the patient was perfectly well, and had gained 20 lb. in weight. This case was the fifth in which a radical operation had been performed, but only the second in which the patient was still living. The diagnosis was made from a history of a previous pregnancy and abortion, irregular hemorrhages, and foul discharge, accompanied with septic symptoms, vomiting, and cachexia. On examining the uterine cavity with the fingers a soft neoplasm could be felt, portions of which were removed and examined microscopically, when the diagnosis was confirmed by finding

[1] Berl. klin. Woch., 1895, No. 29. [2] Arch. f. Gynäk., Bd. xlviii. H. 3, 1895.

processes of decidual cells which invaded the muscle-fibers, thus proving the malignancy of the growth as well as its decidual origin. He concludes that while one may not succeed in removing a specimen for diagnostic purposes which presents such a typical appearance, the clinical history will at least make it clear that a malignant intrauterine growth exists, and that total extirpation is strongly indicated.

Farron and Vignard[1] record an interesting case of diffuse sarcoma of the uterus occurring in a patient 60 years of age, single, and never pregnant. The woman began menstruating at the age of 13, was regular up to 50, and then irregular; her menses ceased entirely 4 months before being seen for the present condition. Two years before, for a period of about 3 months, she had a profuse watery discharge. The patient's abdomen had increased in size during the last 5 years; she had also lost flesh and strength, and complained of abdominal pain. An examination showed a very large abdomen, almost symmetric and giving the impression of pregnancy. Palpation gave a sensation of sacculated fluctuation. Upon opening the abdomen a rose-colored tumor, almost filling the abdominal cavity, presented itself; it was ovoid in form and free from adhesions. From either side spread two large bands, like wings, which contained the enormously enlarged ovaries and tubes. The tumor, which was evidently the enlarged uterus, was removed *in toto;* it weighed, empty, 9 lb. Microscopic examination showed diffuse sarcomatous degeneration of the uterine mucosa.

Ichthyosis Uteri.—Gautier at the International Medical Convention at Geneva first announced that a condition exists in which the cavity of the uterus is lined with stratified epithelium exactly similar to the epithelial covering of the skin or the vagina. Zeller, however, in 1884 was the first to fully describe this condition under the name of *ichthyosis* or *psoriasis uteri.* Ries[2] claims that, although treated lightly at first, Zeller's paper has gained a very great importance since cases of squamous epithelioma have been observed in the cavity of the uterus. According to generally accepted ideas on the formation of malignant growths, we could not expect to find in the uterine cavity any other kind of carcinoma than that composed of and originating from columnar epithelium. Since Piering first published a case of cancroid of the body of the uterus in 1887 the number of cases has so much increased that gynecologists have had to attribute very grave importance to the occurrence of stratified epithelium on the uterine mucosa. There are however, three conditions in which stratified epithelium is observed at places where we would expect to find the normal columnar epithelium of the cavity of the uterus. Pavement epithelium has been observed by Zeller, Küstner, Ruge, and others on cervical polypi, and by Ruge and Gebhard in inversion of the uterus. Ruge has also seen cases of large procidentia of the uterus with deep tears and ectropion of the cervix, in which he observed stratified epithelium in the lower part of the uterine cavity. In all of these conditions the uterine mucosa is in contact with the vagina and vulva. We may speak of a sort

[1] Arch. prov. de Chir., Dec., 1895. [2] Am. Gyn. and Obst. Jour., Feb., 1896.

of infection with pavement epithelium brought about by contact with organs covered with the same variety of epithelium. It is impossible at present to determine whether air may exercise some chemical influence, inducing metamorphosis of columnar into stratified epithelium. Veit calls this process "epidermidalization;" Zeller thinks it belongs to the condition described by him as ichthyosis uteri. Zeller has examined 54 cases of chronic endometritis, 51 of them in persons less than 50 years of age. In all of these cases he found the surface of the mucosa of the uterine cavity covered partly or totally with stratified epithelium resembling that of the skin or vagina. The most superficial cells could be stained yellow by picric acid; generally they contained nuclei. The number of layers of flat cells was from 1 to 4. Below this stratified epithelium he always found the glands increased in size and number. The stratified epithelium sometimes filled the mouth of the glands and covered their columnar epithelium. In all cases the stratified epithelium of the surface formed papillæ. Ries has examined microscopically more than 200 cases of uterine scrapings, but in only 1 of them did he find the condition described by Zeller. He also found it in a case of carcinoma of the cervix, in which the stratified epithelium existed as a level covering of the cavity of the uterus. There were no processes of the epithelium penetrating into the subjacent tissue. No traces of uterine glands could be discovered. He regarded this as a case of simple ichthyosis uteri coexisting with carcinoma of the cervix. Gebhard believes that there are two different series of cases with stratified epithelium: the one kind always remains limited to the surface—simple ichthyosis; the other kind has the tendency to penetrate into the subjacent tissue and form cancerous nests. Pfannenstiel says: "Not every case of stratified epithelium in the cavity of the uterus should be indicative of carcinoma, but the stratified epithelium found in the cases of squamous epithelioma of the cavity of the uterus must be considered the preliminary stage of the carcinoma, just as a glandular hypertrophy of the uterine mucosa, nonmalignant in itself, can be the preliminary stage of adenocarcinoma." Ries, therefore, lays down the following rules: The clinical symptoms of ichthyosis are not sufficiently clear to enable us to found a diagnosis on them. Discharge and light hemorrhage, the usual symptoms of ichthyosis, can as well be produced by carcinoma of the body and several other conditions as by ichthyosis. If we scrape out a uterus and examine the scrapings microscopically, we may only find the stratified epithelium. We are then not enabled to give a diagnosis of carcinoma or of ichthyosis, but must reserve our diagnosis if the epithelium itself does not contain some further clues as to the nature of the disease. In other cases the curet procures sufficient tissue for a precise diagnosis. If we find the stratified epithelium limited to the surface or penetrating only into the mouth of the glands, the diagnosis must be ichthyosis. We must, however, always frequently observe these patients for some time, because we do not know if the ichthyosis will not undergo metamorphosis into carcinoma. If, on the contrary, the microscope reveals cords of pavement epithelium penetrating into the tissues of the mucosa or even into the muscular wall

of the uterus, the diagnosis must be one of carcinoma, and speedy removal of the uterus is indicated. Squamous epithelioma of the uterus does not necessarily originate in previous ichthyosis of the uterus, but squamous epithelioma of the cervix may spread over the mucosa of the body, as in cases described by Benckiser and Hofmeier, or the cancroid of the body may be a metastasis of a cancroid of the cervix, as in a case described by Pfannenstiel.

Carcinoma.—Paschen[1] reports a case of carcinoma occurring simultaneously in two portions of the uterus. This is exceedingly rare. Pfannenstiel has collected 9 cases from literature, and has himself added 2. In 3 cases the body of the uterus and the outer part of the cervix were involved, and in 8 cases the body and the cervical canal were simultaneously affected. In 3 cases the pavement epithelium was carcinomatous; in the other cases the columnar epithelium was involved. In all the cases normal tissue existed between the diseased portions. In Paschen's case the woman was 40 years of age, and had had 6 children and 3 miscarriages. Four months previous to operation she had had a severe hemorrhage, and it was then that the diagnosis of carcinoma of the cervix was made. The patient was then attacked with pneumonia, and during this time had several uterine hemorrhages that were controlled by packing the vagina with iodoform-gauze. The uterus was slightly enlarged, but no irregularities could be felt upon its surface. A vaginal hysterectomy was performed, and the patient made an uninterrupted recovery. Upon examining the specimen a large focus of carcinoma was found in the cervix, but it did not reach to the internal os. On the mucosa of the anterior wall of the uterus a carcinomatous nodule the size of a pea was found. In the posterior wall of the uterus a still larger focus was found, and 3 additional nodules were discovered in the region of the right tube. Paschen believes that the disease was primary in the cervix, and the infection of the body the result of metastasis or by direct inoculation.

Pathogenesis of Carcinoma.—W. R. Williams[2] believes that neoplasms are of intrinsic origin, due to a modification of the formative process by abnormal forces generated within the body, rather than extrinsic, due to inflammation or to the intrusion of microorganisms. Whereas Cohnheim considers that the only cells capable of originating neoplasms are those sequestered during embryonic life, Williams holds that new growth may arise wherever undifferentiated cells are present, and are most prone to originate where such cells most abound. Cancerous growths differ morphologically according to the structures whence they originate and which they resemble histologically, as seen in those of the skin, breast, and rectum; while inflammatory pseudoplasms present the same structure independent of their situation. Cancers possess the power of autonomous growth and development, by which they tend to persist and increase indefinitely, but inflammatory processes tend to disappear. The great resemblance between primary and secondary malignant growth is unaccountable as the basis of inflammatory or bacterial origin. Statistics show that in the great majority of cases the origin of carcinoma cannot be attributed to

[1] Cent. f. Gynäk., Oct. 5, 1895.

[2] Med. Chron., Jan., 1896.

the immediate action of any appreciable extrinsic cause, as traumatism or pre-existing disease. In the genesis of neoplasms two factors act: the cells whence they originated and the force regulating the cellular activities. Spencer has shown that we are justified in assuming that every component cell of the multicellular organisms has the power, under favorable conditions, of developing itself into the form of the parental organisms. Contrary to the opinion of Weissmann, who founded his theory of heredity on the assumption that the reproductive properties of somatic and germ cells are fundamentally different, Williams believes that the somatic properties of somatic and germ cells differ only in degree, the reproductive power of the former being seen in the process of repair and various pathologic processes. That the reproductive activity manifested by somatic cells usually falls so far short of their potentiality is believed by Spencer to be due to the restraining and modifying influence exerted by the whole organism on their protoplasm, which is thus compelled to perform other comparatively subordinate modified functions, in doing which most of the protoplasm is metamorphosed and used up, its reproductive function being greatly reduced or lost. In the higher organisms certain cells never become highly developed, but serve, according as they are more or less unspecialized, either for reproducing the entire individual or for forming and maintaining the various tissues and organs. Such cells abound in all parts, and are *the only real cancer- and tumor-germs.* In the ordinary course of organic evolution cell-growths and multiplication go on until the amount of structure proper to the organism has been produced; then they are restricted within certain limits, in the healthy organism, throughout the life of the individual. Herein we have conclusive evidence of a force regulating the growth and development of the tissues and organs in relation to each other and to the organism as a whole. So long as the growing cells are subject to this normal restraining influence—which has nothing to do with nerves and blood-vessels, themselves integrated structures—they develop in a regular and orderly manner, in accordance with the specific hereditary tendency of the whole; but when the restraining influence is modified or withdrawn, their potential reproductive activity may become actual. The outcome of cells abnormally set free depends chiefly upon the degree of emancipation. In the higher animals this is never complete, and their cells are always more or less differentiated; hence, instead of new individuals, only such structural modifications as neoplasms are produced. Under these circumstances, wherever there is a sufficient supply of nutritive materials a neoplasm will arise. The persistence of the excessive proliferative activity—the essential feature of malignity—is due to the awakening of cell-potentialities of the highest order. J. G. Adami[1] believes that the fundamental phenomenon underlying the development of cancerous or other neoplasms is the assumption of a habit of growth, of rapid cell-division, by certain cells independent of external stimulus. The latent capacity for such growth is illustrated by the reproduction of the whole plant or animal from a fragment of begonia leaf or of a hydra respec-

[1] Mont. Med. Jour., Feb., 1896.

tively; among crustacea, by the reproduction of single parts. In man chronic irritation of moderate intensity causes a proliferation of cells of highly organized tissues with the assumption of an embryonic type; and this at times doubtless passes on into carcinoma. The only distinction between the inflammatory and cancerous growth is that in the former the abnormal growth ends when the cause of irritation is removed, while in the latter the cells have gained the habit of unrestrained growth from frequent and rapid multiplication in a somewhat embryonic state. Among the factors that may possibly be concerned in the production of the habit of growth are increased nutrition, modified nerve-control, chronic irritation, and parasitic action. Parasites may at least be one cause by producing chronic irritation. After the climacteric, when the absorption of certain components of various tissues occurs, other portions receive increased nourishment; and especially when by injury, possibly years previously, a certain amount of instability has already been introduced, we have a condition particularly favorable to irregular and subadult cell-growth. Since benign growths may pass into malignant, all neoplasms should be removed as soon as possible. C. F. Martin[1] argues that irritation alone cannot be the cause of cancerous growths, or else they would occur more frequently. In favor of the theory of parasitic origin he says that parasites frequently cause cell-proliferation independent of inflammatory conditions, as shown by the lymphomata of typhoid and the enlarged spleen of malaria—a proliferation analogous in general features to carcinoma; that they produce metastases, as does carcinoma; that they often select certain cells for their habitat, as blood-cells in malaria, multinuclear leprosy-cells in leprosy, and giant-cells in tuberculosis, while the hypothetic cancer-parasite may equally well choose epithelium. Finally, certain parasites, coccidia, cause in the bile-ducts of rabbits an increase of epithelial and fibrous tissue closely resembling malignant adenoma of the rectum. F. J. Shepard[2] considers local irritation the most potent of many exciting causes of carcinoma. J. P. Warbasse[3] says that Cohnheim regarded as the cause of the formation of tumors a failure or irregularity in the embryonal tissues, showing that in normal development, and indeed very early, certain groups of cells, instead of continuing to grow, remain latent and later develop into tumors, this development occurring when the blood-supply is increased, the resisting power of the surrounding tissue diminished, or under some other condition. A great obstacle to the acceptance of this theory has been that these hypothetic separated cells cannot be discovered, and experiments have done little to support the theory. Roux, however, discovered separate colonies of cells in the middle, more rarely in the inner, embryonal layer of frog embryos, sometimes in large numbers scattered among the other cells. Late impregnation was the most important condition for their development. Roux's observations are not complete, for he could not say what would become of these cells, and whether a tumor would have developed from each one; but they taught the possibility of a separation of cells, as Cohnheim had assumed. Barfurth observed that by puncturing and

[1] Mont. Med. Jour., Feb., 1896. [2] Ibid. [3] Ann. of Surg., Jan., 1896.

turning in the ectoderm of the gastrula a growth of cells very like a dermoid took place. Here also we do not know what such a group of cells would do in a fully-developed embryo. From the observations of Ribbert[1] and others the writer concludes that tumors originate before and after birth from a partial or complete separation of cells or groups of cells from their organic connections, traumatism being an influence capable of causing the epithelial metastasis. The separated cells, no longer subject to the restraining influence of their normal connections, and still receiving an adequate nourishment, grow and form tumors which, according to the size and organization of the separated mass, correspond in general structure with the organ from which they sprang, sometimes more, sometimes less. Ribbert's theory of the origin of carcinoma does not necessitate the lying dormant of carcinomatous cells for 40 years, but explains how diseased or normal epithelial cells may become separated by trauma, inflammation, or other causes, and continue to grow surrounded by connective tissue and in easy access to the lymphatic channels. It may be regarded as a continuation and elaboration of Cohnheim's theory.

The Parasites in Uterine Carcinoma.—Müller[2] reports careful examination of the carcinoma-cell contents for parasites in 21 cases of uterine carcinoma. The result was that in 1 case of carcinoma of the posterior lip of the cervix he saw 3 cyst-formed bodies which were pale and glassy, with a colorless membrane. They are minutely described and shown in drawings. Smaller cyst-like bodies with and without contents are also shown. Besides these, in the same case, intracellular bodies without a capsule were found. These parasites, according to Müller and others, are ameboid organisms. The encapsulated is probably the more constant form of intracellular ameboid. He believes that their presence cannot be positively proved in fixed preparations. They must be seen in living tissue in pure culture. Braithwaite[3] states that out of a very large Jewish population in Leeds in not one Jewess has he ever met with carcinoma of the genital organs, whereas it is extremely common among Christian women. The inference is that the microorganism, if such exist, is introduced by the husband concealed beneath the prepuce.

The Anatomy of Carcinoma Uteri.—Veit[4] makes some important practical suggestions growing out of his more recent anatomic studies of this subject. He does not think that sufficient attention has been paid to the different varieties of carcinoma in the giving of a prognosis as regards recurrence after hysterectomy, nor is he inclined to agree with Winter in his statement that a considerable proportion of such recurrences are due to the infection of healthy raw surfaces during the operations. He divides carcinoma of the cervix clinically into those cases in which the disease is situated in the portio or in the cervical canal, and those in which it appears in a nodular form in the cervix, or as disease of the corporeal endometrium. Primary nodules in the cervix originate in the connective tissue, and are now regarded as endothelioma. As regards extension of the disease, Veit has often found cancer-cells in the

[1] Deutsch. med. Woch., 1895, Nos. 1–4.
[2] Arch. f. Gynäk., Bd. xlviii. H. 2, 1895.
[3] Lancet, June 29, 1895.
[4] Centralbl. f. Gynäk., 1895, No. 24.

lymphatics of the broad ligaments; when these infected vessels are divided during operation it is natural to infer that they form foci from which a rapid recurrence takes place. The latter form of recurrence is characterized by the fact that the metastatic deposits present the same histologic structure as the primary disease, and that they rapidly invade the deeper tissues. The simultaneous appearance of two apparently independent primary carcinomatous nodules can usually be explained by referring the more deeply-seated one to secondary infection.

Varieties of Uterine Carcinoma.—A case of primary horny epithelioma of the corpus uteri—a condition quite distinct from the squamous epithelial new-growth described by Zeller as ichthyosis uteri—is recorded by Flaischlen,[1] and cases of secondary growth by Emanuel,[2] and Rosthorn.[3] Flaischlen classifies the disease in three categories: (1) The superficial extension of a cervical cancroid over the inner surfaces of the uterine body; (2) The metastases of squamous epithelioma from a primary cervical carcinoma; (3) The development of a primary squamous epithelioma on the endometrium of the uterine body. As regards the origin of both of the secondary forms, all authors agree that they develop from the superficial squamous epithelium. In the development of this form of carcinoma the glands of the endometrium are undisturbed. Of the greatest interest is the primary development of squamous epithelial carcinoma in the corpus uteri. In addition to the present report only 3 cases are to be found in literature (Piering, Gebhard, and Löhlein). As a rule, primary epithelioma of the uterine body appears in women who have passed the menopause. Flaischlen's case occurred in a woman 54 years of age, Emanuel's case in one 44 years of age, and Rosthorn's case in one 41 years of age.

Malignant adenoma of the corpus uteri has been exhaustively studied by Beyea[4] (see Plate 4) and Stone.[5] Beyea states that there is considerable diversity of opinion as regards the nomenclature of this disease, whether it should be regarded as a form of adenoma or a carcinoma, since in many instances it first appears as an atypical adenoma, and as the disease advances it resembles glandular carcinoma. Its definite character as malignant adenoma was first described by Schröder in May, 1876, at a meeting of the Berlin Obstetrical and Gynecological Society. In March of the same year Martin saw and operated upon his first case. Goodell refers to it as villous degeneration of the endometrium; Ruge and Veit, as glandular carcinoma; Ziegler, as adenoma destruens; Wyder, as a malignant adenoma. Williams definitely separates malignant adenoma and carcinoma. A number of cases of malignant adenoma have been referred to by Winckel, Gusserow, and Schröder; Martin has operated upon 19 cases; Hofmeier has reported 15 cases; and Schönheimer, 1 case; Goodell, Mann, and Duncan have reported cases as villous degeneration; Coe has seen 4 cases, and in the past 2½ years Beyea has seen 4 cases. Stone also reports 4 cases. Its relative frequency as compared with other forms of

[1] Centralbl. f. Gynäk., No. 22. 1895. [2] Ibid. [3] Ibid., No. 15, 1895.
[4] Am. Jour. Obst., vol. xxxiii. No. 2, 1896. [5] N. Y. Med. Jour., July 27, 1895.

PLATE 4.





FIG. 1.—Malignant adenoma (advanced). FIG. 2.—Benign adenoma. (From drawings furnished by Dr. H. D. Beyea.)

primary malignant disease cannot be estimated, but it is very rare. Like alveolar carcinoma, it occurs more often in multiparous women and in the postclimacteric period. It may, however, be seen as early as 20 years. Stone states that it usually occurs later in life than carcinoma, and lasts longer without causing cachexia. It is not so apt to give metastasis. Pain and discharge, according to Stone, are not such prominent symptoms in adenoma as in carcinoma, but uterine enlargement is more marked. Histologically, it appears as a benign adenoma that has undergone malignant degeneration. The gland-spaces are very much enlarged, very irregular, and are frequently seen to break through into other gland-spaces. The columnar epithelial cells are attached to the stroma as a rule, and they are often converted into cuboidal or even squamous cells, which may frequently be seen filling up a gland-space; they, however, never infiltrate the interstitial or stroma tissue. The disease extends to, and appears to progressively destroy, the muscle-wall by atrophy or perhaps fatty degeneration. It persistently progresses as an atypical glandular epithelial type of disease. An early diagnosis from the history of the symptoms and a physical exploration cannot be made, but Beyea states that at least 90% of the cases can be diagnosed by microscopic examination, but that the pathologist should be thoroughly familiar with the histologic appearance of every other disease that affects the corporeal endometrium.

Diagnosis of Carcinoma.—Most important in the prognosis of uterine carcinoma is the early recognition of the disease. Kessler[1] calls attention to the fact that while carcinoma of the uterus if attacked in the early stage can be cured by a radical operation, the mortality of which is only 5%, as a matter of fact not over 15% of those thus treated survive, because the patients apply too late to be cured. Statistics show that in the majority of the cases well-marked symptoms have been present for a year or more before the disease was recognized, and that in 50% of these the family physician failed to make a vaginal examination, which should never be omitted in the case of any woman 45 years of age or upward with atypical hemorrhages.

Neumann[2] reports a series of 1000 cases of postclimacteric hemorrhage from the genital tract, collected in the Schauta Clinic in Vienna. In more than half of the cases (54%) the hemorrhage was due to carcinoma of the cervix. Neumann believes that when chronic and severe metrorrhagia occurs in a woman who has passed the menopause, and she is failing in health and becoming anemic, a diagnosis of carcinoma of the corpus uteri can be made almost with certainty, provided there be not carcinoma of the vaginal cervix. Robb[3] claims that carcinoma of the cervix occurs more than 50 times as often as carcinoma of the corpus uteri. He regards an elevated area differing a little in color from the sound mucosa, and tending to bleed freely upon the slightest touch, as a suspicious condition, and, if this be persistent, the uterus should be removed. He does not have faith in the microscopic examination of the mere

[1] St. Petersburger med. Woch., 1895, No. 37.

[2] Monatsh. f. Geburtsh. u. Gynäk., Bd. 1, H. iii., 1895.

[3] Am. Gyn. and Obst. Jour., Sept., 1895.

scrapings of the curet, for he states that it is possible to have an increase in the number and size of the glands, and even the presence of more than one layer of epithelium, without any coexisting malignant disease. It is only when the subjacent tissues have been invaded by the disease that the diagnosis becomes sure. To determine this, a portion of the cervical tissue must be cut out and examined microscopically. Thornton[1] lays special stress upon the characteristic sacral pain so commonly present, which, according to Griffith,[2] is not only not relieved when the patient lies down, but usually becomes worse or at least less bearable. It is also referred more frequently to the region of the trochanters than is pain due to other causes. Sinclair[3] emphasizes the diagnostic importance of the extreme friability of carcinomatous tissue as exemplified by the use of the curet. If the tissue be not malignant, the curet will only make the parts bleed.

Upham[4] heartily endorses Cullen's formalin method for the rapid diagnosis of uterine scrapings. The method is as follows: The specimen is frozen by carbonic acid or ether, and cut; then (*a*) place the frozen section in 5% aqueous solution of formalin for from 3 to 5 minutes; (*b*) leave in 50% alcohol 3 minutes; (*c*) in absolute alcohol 1 minute; (*d*) wash out in water; (*e*) stain in hematoxylin for 2 minutes; (*f*) decolorize in acid alcohol; (*g*) rinse in water; (*h*) stain with eosin; (*i*) transfer to 95% alcohol; (*j*) pass through absolute alcohol, then through either creasote or oil of cloves, and mount in Canada balsam. Upham records 6 cases in which the diagnosis of malignancy was made by this process.

Treatment of Carcinoma.—[The abdominal route has been steadily growing in favor among the American gynecologists, to the exclusion of kolpohysterectomy, notwithstanding the efforts of some men to substitute for both the improved combined vaginoabdominal method, which is merely the old Freund operation in a new guise, and which is a far more dangerous operation than either of the others. The points that have been offered in support of the abdominal route are the greater ease with which it may be accomplished, the smaller amount of mutilation, the field of operation being left in a much more satisfactory condition than after the vaginal operation; there is no need of drainage in the abdominal operation because of the complete closure of the peritoneal cavity, while after vaginal hysterectomy the abdominal cavity cannot be entirely closed with safety, and the drain extending through the vulvar orifice is a possible source of infection, and therefore a constant menace to the safety of the patient. Again, extrusion of the bladder through the vaginal route is a much more common sequence than ventral hernia after the abdominal operation.] Finally, as Fish[5] remarks, in some cases of vaginal hysterectomy complete ligation of the broad ligaments and the contained vessels cannot be done, and clamps must be used, with the attendant objections. The main objection to the abdominal operation is the greater immediate danger from shock. Martin[6] in an

[1] Brit. Med. Jour., Feb. 1, 1896. [2] Ibid. [3] Med. Chron., Aug., 1895.
[4] Am. Jour. Obst., June, 1896. [5] Boston M. and S. Jour., cxxxii. No. 25, p. 615, 1895.
[6] Edinb. Med. Jour., Mar., 1896.

able paper strongly endorses the abdominal panhysterectomy (see Figs. 112–115) for uterine myomata as well as for other diseases. He ligates the broad

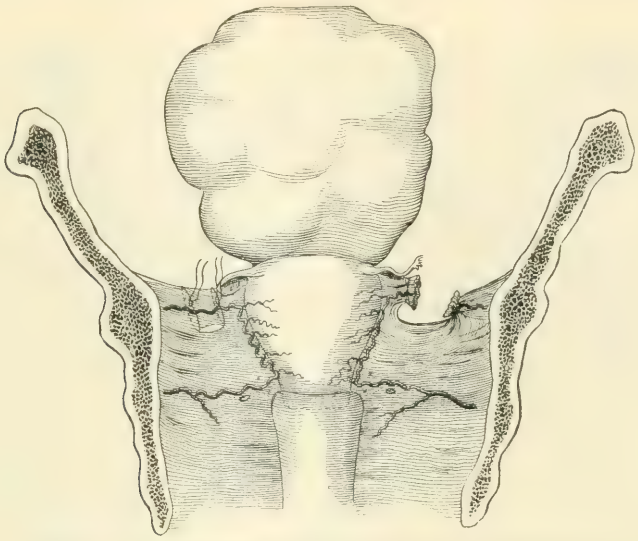


FIG. 112.—Panhysterectomy: first step (Edinb. Med. Jour., Mar., 1896).

ligament in sections, with double ligatures, as far down as the internal os, employing for the purpose Galabin's pedicle-needle—a blunt fully-curved needle with two large eyes—and sterilized silk (No. 5). The bladder is then

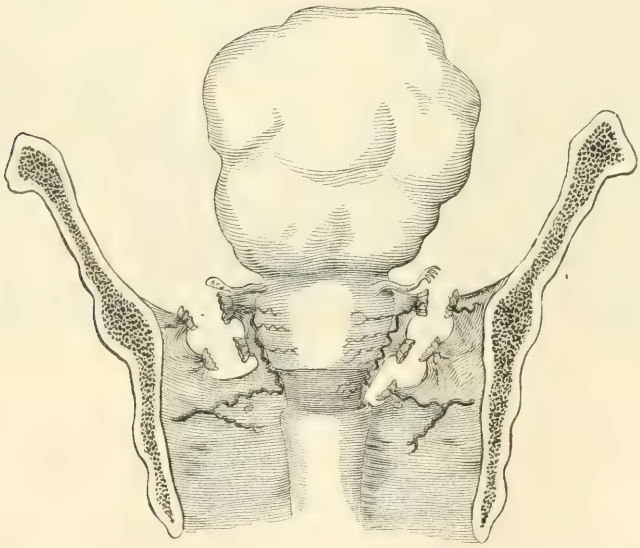


FIG. 113.—Panhysterectomy: second step (Edinb. Med. Jour., Mar., 1896).

stripped off, and the vagina opened close to the anterior lip of the cervix by cutting upon a Wells's forceps introduced through the vulva. The uterine

arteries are then ligated and the uterus removed. The ligatures controlling the uterine arteries are drawn down into the vagina and a piece of gauze inserted. In all cases of cervical carcinoma in which the infection has extended



FIG. 114.—Panhysterectomy: third step (Edinb. Med. Jour., Mar,, 1896).

to the pelvic glands, in all cases of recurrence after hysterectomy, and in so-called inoperable cases, Pryor[1] advocates the ligation of both internal iliac arteries as a step preliminary to any other. He claims that the disease is

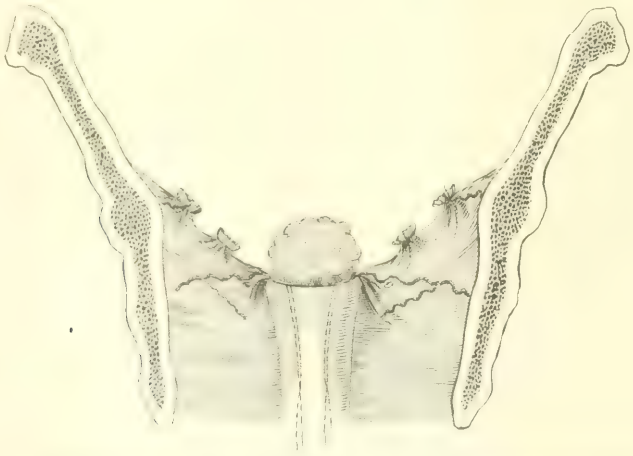
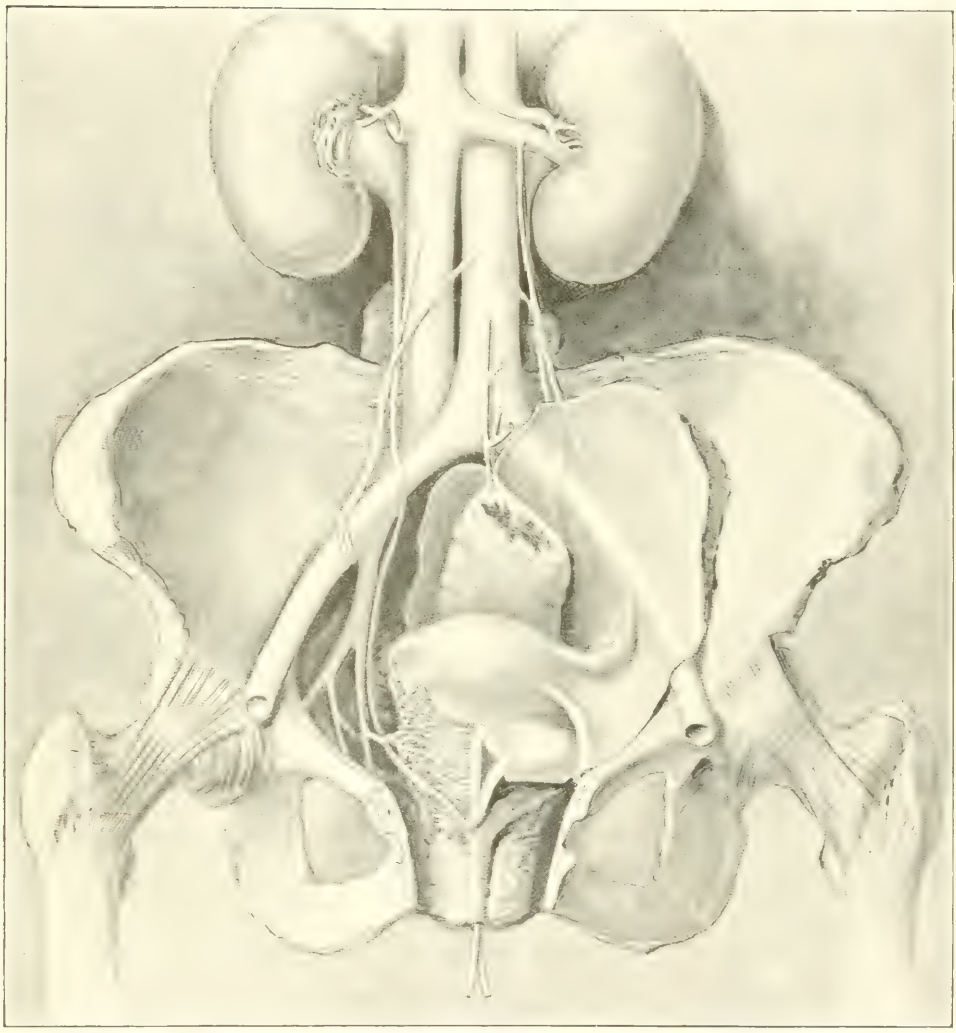


FIG. 115.—Panhysterectomy: completed operation (Edinb. Med. Jour., Mar., 1896).

retarded by this procedure. Clark[2] is convinced of the inadequacy of any method of treatment of uterine carcinoma. He states that recurrence in slight involvement of the broad ligament results from cutting the broad ligaments too closely to the uterus and from not removing a sufficient quantity of the vagina. To overcome this error he advises, and has practised in 2 cases, the

[1] Am. Jour. Obst., June, 1896.

[2] Johns Hopkins Hosp. Bull., Nos. 52, 53, July, Aug., 1895.



Hysterectomy for cancer of the uterus. The peritoneum of one side of the pelvis is dissected off, showing the intimate anatomical relation of the bladder, uterus, uterine artery, and ureter. Bougies are inserted into the ureters, making them stand out as rigid tubes. The close relations of the uterine artery and ureter and the ureter and cervical portion of uterus are well demonstrated, showing the impossibility of a wide excision of the broad ligaments without the introduction of the bougies into the ureters (Johns Hopkins Hosp. Bull., July-Aug., 1895).

following method of abdominal hysterectomy (see Plate 5): (1) Bougies are inserted into the ureters under the local effect of cocain. (2) An abdominal incision is made of sufficient length to ensure free manual movement. (3) The upper portion of the broad ligament with the ovarian artery is ligated as near as possible to the pelvic wall; the vesicouterine peritoneum is divided around the opposite side, the bladder is pushed off, and the layers of the ligament are pushed apart, exposing the uterine artery. (4) *The uterine artery is dissected out for 2.5 cm. from the uterus beyond the vaginal branch, and tied.* (5) The ureter is dissected free in the base of the broad ligament. (6) The remainder of the broad ligament is ligated close to the iliac vessels and cut away from its pelvic attachment. (7) The dissection is carried well down below the carcinomatous area, even though the cervix alone seems to be involved. (8) The opposite side is treated in the same manner. (9) The vagina is perforated with sharp-pointed scissors, strong traction being made on the uterus with small volsella forceps, so as to pull the vagina up and make its walls tense; it is then ligated in small segments (1 cm.) and each segment cut as it is tied. (10) Iodoformized gauze is inserted from above into the raw space left by the hysterectomy; the vesical and rectal peritoneum are drawn over this with a continuous fine silk suture. (11) The pelvic cavity is irrigated, and the abdomen closed without drainage. There are three essential steps in this operation that differ from those now employed: 1. The introduction of the bougies, allowing a more extensive extirpation of tissue adjacent to the uterus without danger to the ureters; 2. The ligation of the upper portions of the broad ligaments and ovarian arteries, cutting them close to the pelvic walls, opening the two layers, and ligating before excising any tissue; 3. The excision of a much larger portion of the vagina than is usual. The uterine artery is ligated close to the pelvic wall, as the ligature will be less apt to contain carcinomatous tissue, the danger of hemorrhage is eliminated, and the broad ligament can be cut away close to its attachment. [The main objection to Clark's operation is the length of time required for its performance. It is impossible to complete the operation under two hours, and but few patients can withstand the shock of the prolonged etherization.]

Lewers[1] has made a careful study into the relative advantages of vaginal hysterectomy and supravaginal amputation of the cervix in carcinoma of the cervix uteri. In 23 vaginal hysterectomies performed by him there were 3 deaths, while in 26 supravaginal amputations of the cervix all recovered. As regards the amount of mutilation incidental to the two operations, obviously vaginal hysterectomy involves much more mutilation than the high amputation of the cervix, and still more so if the uterine appendages are removed at the same time, as is the practice of some operators.

The indications for the Kraske method of extirpating pelvic growths as laid down by Bacon[2] are—1. When the uterus is too large to remove through the vagina and the tumor is impacted in the pelvis. 2. When carcinoma of the body of the uterus would infect the peritoneum if removed by any other

[1] Lancet, July 6, 1895.

[2] Am. Jour. Obst., Feb., 1895.

method. 3. When the carcinoma involves the vagina and uterus and sacral glands. 4. Pelvic dermoids or inflammatory deposits that have suppurated and opened into bladder and vagina or rectum. 5. Large tumors of the prostate. 6. Large paravesical tumors. 7. Malignant growths of the uterus involving the rectum. 8. Pelvic deformities, especially osteomalacia.

Borelius [1] has endeavored, by means of two modifications of the Rehn-Rydygier method—*i. e.* "the anterior and posterior sacral section," to restore the bony pelvis as well as the ligaments, as far as possible, to their normal condition; also to avoid paralysis of the bladder and rectum. He attained the latter object by means of an oblique resection from the lower border of the third sacral notch on the one side to the lower border of the fourth sacral notch on the other. In this way he preserved the function of the important fourth sacral nerve on one side. By this method he has operated upon 3 cases of cancer of the rectum and upon 4 cases of uterine carcinoma that could not be removed through the vagina.

Vaginal hysterectomy finds its most ardent advocate in Jacobs of Brussels. He is supported by a host of others, including Pichevin, Engelmann, Landau, and others. Jacobs [2] believes that vaginal hysterectomy is the best operation for the cure of uterine carcinoma, and that other methods are very rarely indicated. The contraindication for the operation is extension of the disease to other organs. The age of the patient is also important. When under 40 years of age hysterectomy should be performed only when the disease is in the beginning stage; after 55 years the progress of the disease is so slow that quite as good results are gained by the palliative as by the radical treatment. Jacobs [3] gives as the indications for the operation: 1. Uterine carcinoma; 2. Uterine fibroids; 3. Extrauterine pregnancy; 4. Total genital prolapse; 5. Inflammatory diseases of the appendages; 6. The chronic and incurable diseases of the appendages and of the uterus; 7. The diseases of the uterus after abdominal operation. He has performed the operation 403 times with 12 deaths, giving a mortality of 2.9%. In performing the operation for uterine carcinoma it is essential that there be integrity of the vaginal culdesac, complete mobility of the uterus, and a satisfactory general state of health. The great danger of the operation is the formation of fistulæ (peritoneal, vesical, ureteral, and intestinal). In his 403 cases he has observed 9 fistulæ after the operation. The instruments necessary for the operation [4] are a perineal retractor, 2 lateral retractors, a pair of strong scissors, 2 traction forceps, 6 long forcipressure forceps, a thermocautery. The vaginal mucosa is incised with the thermocautery all around the neck, for a good centimeter in length from the diseased tissues, as far as the cellular tissue. The bladder and rectum are freed by the finger, the anterior and posterior culdesacs are opened with scissors, and the broad ligament is divided with the aid of forceps. Richelot [5] publishes the results of 274 vaginal hysterectomies performed by himself.

[1] Centralbl. f. Gynäk., No. 34, 1895.
[2] Ann. de l'Inst. Ste. Anne, 1895, No. 2.
[3] Trans. Am. Gyn. Soc., vol. xx., 1895.
[4] Am. Gyn. Jour., Mar., 1896, p. 281.
[5] L'Union méd., Nov. 16, 1895.

Of these, 44 were for carcinoma, with 3 deaths; 61 were for suppurative diseases, with 5 deaths; 126 were for nonsuppurative diseases, with 5 deaths; and 43 were for fibromata, with 1 death. This gives a mortality in all cases of 5.1%. Schmid [1] reports the results of 42 cases in which vaginal hysterectomy was performed for carcinoma: 30 were carcinoma of the cervix, 7 carcinoma of the corpus uteri, and 2 a carcinomatous degeneration of myomata.

Russell [2] reports the clinical course of 47 cases of carcinoma of the uterus subsequent to hysterectomy. In 40 of the cases the vaginal route was adopted, the abdominal in 4, and the combined operation in 3 cases. 10% of the cases died from the primary effect of the operation; 44% are still living; 34% died with recurrence; 8% were not heard from; and 2% died from heart-lesion.

Infection in hysterectomy has attracted considerable attention, and in order to overcome this danger Mackenrodt [3] has adopted a method of hysterectomy by the cautery alone, without the use of permanent clamps or ligatures. This procedure he terms *igniextirpation of the uterus*, or [unphilologically] *thermocauterectomy*. This, while a new departure abroad, has been performed in this country by Byrne of Brooklyn [4] in several instances with success. Mackenrodt has performed 4 vaginal and 2 vaginoabdominal hysterectomies according to the following method: After thorough cleansing of the vagina the cancerous tissue is removed with the sharp spoon, the raw surface cauterized, and the vagina is again disinfected with soap and water, alcohol, and mercuric chlorid solution. If the introitus is narrow, more room is gained by deep lateral incisions made with the Paquelin at a white heat. The uterus is then drawn downward with a volsella, and Douglas's pouch is opened with the cautery. Then the lateral, and finally the anterior vaginal, fornices are divided in the same manner. The anterior vaginal wall is pushed upward with the thumb of the left hand, so as to put the attachments between the uterus and bladder on the stretch; these are divided by light touches with the Paquelin. The lower portion of each broad ligament is now included in a special form of clamp, and is burned through on the uterine side; after thoroughly charring the stump the forceps are removed, care being taken not to disturb the eschars. Any bleeding point is seized with forceps and again touched with the cautery. The uterus is now drawn downward still more, and the separation of the bladder and vesicouterine fold of peritoneum is completed with the cautery. Under the guidance of the fingers the upper portions of the broad ligaments are grasped in turn with the temporary clamps, and are separated as before, the intestines being meanwhile protected with gauze. Great care is necessary in cauterizing the stumps containing the ovarian arteries, and sometimes it may seem advisable to apply ligatures, although the writer has been obliged to do this in only 1 instance. The wound is dressed in the usual manner. When there are secondary deposits in the upper portions of the broad ligaments, Mackenrodt secures the uterine arteries from below, and when it is evident that firm adhesions are present he opens the abdomen and completes the operation from above.

[1] Centralbl. f. Gynäk., No. 43, 1895. [2] Johns Hopkins Hosp. Bull., Nov., Dec., 1895.
[3] Centralbl. f. Gynäk., 1895, Nos. 18 and 24. [4] Am. Jour. Obst., Oct., 1895.

Ries[1] objects to this operation on the ground that cancerous nests are left in a spot that cannot be attacked with the cautery—namely, in the iliac glands, lymphatic glands lying between the external and internal iliac artery and vein, the uppermost being usually at the bifurcation of the common iliac artery. They can only be removed after abdominal section. Ries therefore recommends a combined method, cauterizing from below, removing the uterus and appendages from above, and opening the peritoneum on the posterior wall of the pelvis, and digging out these glands from the connective tissue. Byrne[2] states that it would appear that uterovaginal structures that have been severed by the galvanocautery, or from which diseased portions have been excised by such means, are left in a state more favorable for restoration to a normal condition than when the scalpel or scissors has been employed.

AFFECTIONS OF THE PELVIC VISCERA.

Diagnosis of Pelvic Disease.—As Edebohls[3] has very aptly indicated, bimanual palpation forms the *sine qua non*, the very essence, of gynecologic practice. He would distinguish *diagnostic* palpation from *therapeutic* palpation, the latter embracing massage in its various forms, the bimanual reposition of the retroverted uterus without the aid of instruments, the divulsion of intrapelvic adhesions in narcosis after Schultze, and other procedures. In order to secure success in diagnostic palpation the bowels and bladder should be emptied, the garments loosened, and the patient resting upon a proper table in a suitable position. Obstacles to successful vaginoabdominal palpation are a short vagina, unusually high position of the uterus and of its adnexa, and a well-developed panniculus adiposus. These obstacles can in nearly every case be overcome by combined rectovaginoabdominal palpation. In practising the latter palpation the fingers of one hand are placed on the lower abdomen in the usual way; the index finger of the other hand is passed into the vagina, while the middle finger of the same hand enters the rectum; or the thumb may be passed into the vagina and the index finger into the rectum, at the option of the examiner. By means of this touch the examining fingers penetrate the pelvis to a much greater depth, the perineum being carried upward to the extent of about 3 cm. upon the web between the vaginal and rectal fingers; the rectal finger must penetrate beyond the third sphincter, the situation of which corresponds in height with that of the os internum. In *virgines intactæ* the bimanual examination assumes the form of a rectoabdominal palpation. In very fat women a transverse crease or furrow, deeply indenting the panniculus adiposus, exists just above the pubis, and in this furrow the finger-tips of the outer hand should rest, thereby facilitating the examination. To secure complete relaxation of the muscles of the abdominal wall the routine examination of patients with abdominal or pelvic tumors in a full hot bath is recommended and practised by F. Chlapowski. Edebohls would prefer examining the patient immediately after the emergence of the patient from the bath.

[1] Chicago Med. Recorder, Nov., 1895. [2] Loc. cit.

[3] Physician and Surgeon, Sept., 1895.

Demons[1] warns against taking the umbilicus as a fixed point in examining the abdomen. In 1 case he found the umbilicus below a line joining the iliac spines; the low position of the umbilicus led him to diagnose an ovarian tumor as a tumor of the mesentery. He has observed 4 cases in which a malignant tumor of the abdomen was associated with a secondary tumor of the same nature at the umbilicus. Bushbeck and Ettinger[2] conclude a clinical and diagnostic study of parametritic and perimetritic exudates with these practical observations: High fever of a pyemic type may exist for weeks, yet incision of the primary focus of infection may reveal the presence of serum only; this may contain only leukocytes or numbers of streptococcus-chains. Exudates of stony hardness may contain small quantities of pus or serum. Until the fluid is evacuated the temperature remains elevated. This fact explains the negative, or even harmful, effects of massage in such cases.

[Bacteriologic investigations are assuming a less important role in the work of the gynecologist than at one time seemed probable. According to Penrose,[3] the bacteriologic study of inflammatory diseases of the Fallopian tubes and ovaries has not only enlarged somewhat our knowledge of the pathologic processes affecting these structures, but promises to be of practical value in the treatment of the morbid conditions (see Plate 6). The pathogenic organisms that are found in inflammation of the uterine appendages are the gonococcus, the streptococcus, the staphylococcus, the bacillus coli communis, the tubercle bacillus, and the pneumococcus. Bacteriology has demonstrated that the pus—in suppuration of the uterine appendages—does not contain microorganisms in every case; and, secondly, the danger of peritoneal infection from the pus of a pelvic abscess is dependent upon the variety of organism present. A microorganism is present at some stage of the pathologic process in every case of suppuration of the uterine appendages; as the disease progresses, however, the microorganism dies and disappears and the pus becomes sterile. Such a result probably occurs in every case that runs a chronic course for a sufficient time. It seems probable that an acute attack of inflammation in a chronic case is accompanied by the presence of active microorganisms, and in any chronic case there is always danger of infection by the bacillus coli communis passing through an adherent intestinal wall. The cases in which Penrose has found microorganisms have been those in which decided constitutional and local symptoms were present before the operation. These symptoms are pyrexia, coated tongue, rapid pulse, and marked pelvic and lower abdominal pain and tenderness. A fact of practical importance is, that microorganisms may be found not only in the pus of a pelvic abscess, but in the substance of the abscess-wall; the pus may be free from organisms, while they are present in the wall. The danger of peritonitis or of peritoneal sepsis after intraperitoneal rupture of a tubal abscess is dependent upon the character of the microorganisms found in the pus. The danger may be nothing or very great. The pneumococcus seems to be virulent in the peritoneum;

[1] La Sem. méd., 1895, No. 40, p. 342. [2] Arch. f. Gynäk., 1896, B. i. H. 2.
[3] Am. Gyn. and Obst. Jour., Aug., 1895.

the gonococcus seems to be of but doubtful danger to the peritoneum. The staphylococcus, streptococcus, and bacillus coli communis are the organisms that usually cause peritonitis or peritoneal sepsis, and are, especially the last named, very virulent. Peritoneal sepsis depends not only upon the character of the organisms that have entered the peritoneal cavity, but also upon the character of the fluid in the peritoneum and the condition of the serous surface. The healthy peritoneum has the most extraordinary power of absorption, and peritonitis is most likely to occur when there has been chemical or mechanical injury to the absorbing serous surface, when a good culture-medium remains in the peritoneal cavity. Extravasation of blood or serum in the peritoneal cavity, long exposure of the peritoneum, and damage to the serous surface, all aid the development of peritonitis.

Bard[1] of Lyons calls attention to the method of **lumbo-abdominal palpation** in the diagnosis of peritoneal effusions. The patient is placed in a sitting posture, bending slightly forward. The examiner places one hand on the back in the situation of the quadratus lumborum, close to the vertebral column. His other hand is placed on the various parts of the abdominal wall in front. The impulse transmitted by the impact of the hand, placed posteriorly, is felt with ease and clearness by the anterior hand when ascitic fluid is present, just as it is in palpation by the ordinary method. The transmitted wave is felt badly or not at all from before backward, except in extremely abundant effusions. The pressure, therefore, is to be made always with the posterior hand, from behind forward. The method is capable of detecting very early and slight effusions, inaccessible to other procedures, if the anterior hand be placed low down on the hypogastric region just above the pubis. It is also particularly useful in cases of extreme ascites, when the tension is such as to prevent the palpation of the peritoneal contents. When solid masses are interposed in the trajectory of the lumbo-abdominal wave it is not perceived or is extremely feeble. In such a case the wave may be clearly perceived on one side, and be completely absent on the other, while the ordinary anterior method fails to distinguish any difference between the two sides. In this manner there may be gained a knowledge of the existence of a solid mass in the peritoneal cavity, and various modifications of the method may be employed for the differential diagnosis of ovarian cysts and other intraabdominal collections of fluid from peritoneal effusions.

The Influence of Castration on Structural Changes of the Uterus.—Sokoloff[2] presents the results of a series of interesting experiments upon bitches and rabbits, undertaken with the view of determining the anatomic changes that take place in the uterus after the removal of one or of both ovaries. After the former operation the heat returned as before, but in no instance after the removal of both ovaries. The animals were killed at different periods after the operation, varying from 20 days to 14 months; their uteri were removed and hardened, and sections were made. No variations from the normal were noted in cases in which a single ovary had been removed, but

[1] L'Union méd., No. 37, 1895.

[2] Arch. f. Gynäk., Bd. li. H. 2, 1896.

after complete castration a well-marked atrophy of the circular muscular layer was observed, which reached its height 4 months after operation, as well as a disappearance of numerous muscular fibers in the longitudinal layer. The caliber of the vessels was diminished and their walls were thickened, especially in uteri removed several months after castration. The endometrium remained unchanged even a year or more after the operation. Sokoloff denies that the atrophy of the uterus following castration is due to ligation of the spermatic arteries, since the collateral circulation is speedily restored. It must, then, be attributed to a disturbance of nutrition in the uterine tissue, secondary to extirpation of the ovaries, of nervous origin, either central or dependent upon the removal of vasomotor or trophic centers in the ovaries themselves. The writer favors the latter theory. Every tissue must, in order to retain its normal structure, perform its normal functions as well as receive a proper amount of nourishment. When the normal physiologic stimulus of this tissue is absent and its function is accordingly suspended, it undergoes atrophy, even though its nutrition be not disturbed. The regular rhythmic contractions of the uterus cease after extirpation of the ovaries which are the seat of the exciting impulses; its normal functions, menstruation and pregnancy, are eliminated, and muscular atrophy results. The endometrium, not being influenced by these contractions, remains unchanged. The latter phenomenon may be explained on the theory that the mucosa and utricular glands are presided over by a special nerve-center independent of the atrophic center regulating the muscular tissue.

Hysterectomy for Suppurative Disease of the Pelvic Organs.—In considering the important matter of the substitution of hysterectomy, abdominal or vaginal, for salpingo-oophorectomy, to effect a permanent cure of inflammatory diseases of the uterus and its adnexa, Norris[1] remarks that the test as to the value of the two operations is the comparative ultimate results, and states that the cases are now sufficiently numerous to indicate a favorable verdict for hysterectomy. It has been the experience of all operators that in many cases after the removal of both tubes and ovaries the patients have not been completely cured. Their pain and discharge have remained, and the various courses of constitutional and intrauterine medication have failed to ameliorate the condition. Only after the performance of a secondary operation for the removal of the uterus will relief of the symptoms follow. He further states that the shock following the more radical operation is usually not greater, and often is less, than after salpingo-oophorectomy; that convalescence is more satisfactory; that the liability to hernia is less, since drainage is seldom necessary; that the nervous disturbances of the enforced menopause are less troublesome; and, finally, that ultimate cure is more often obtained. The conditions of the pelvic organs that make it necessary to remove the uterus are not very numerous, yet one or all of these conditions will accompany most cases of long standing and some acute cases of pelvic inflammation. As a rule, it is best to remove the uterus along with the broad ligaments, tubes, and ovaries when

[1] Univ. Med. Mag., Dec., 1895.

the womb is enlarged and its walls are infiltrated, or when it is so densely adherent to adjacent structures that their enucleation seriously injures the uterine tissue or interferes with its blood-supply. While, however, a very large proportion of cases of pelvic inflammatory disease are suitable for hysterectomy, it must be remembered that this operation requires much skill and good judgment, the risk being greater in proportion to the operator's inexperience and the patient's inability to stand the necessarily longer administration of the anesthetic. Van de Warker[1] believes that in many cases of marked pelvic disease the uterus should be removed—not because it is diseased, but because by the removal of the organ the cellular pelvic spaces are opened up and the necessary drainage afforded to the cellulitis there existing. In his opinion, hysterectomy affords the only route to this area of intrapelvic inflammation. He claims that there is a simple diagnostic sign which when discovered is proof of the presence of cellular inflammation and indicates the removal of the uterus. The infiltrated cellular spaces, whether in the broad ligament extending laterally into the iliac fossa, or draining through connective-tissue spaces into the vaginal septum, or through the pubosacral areolar process to the lateral surfaces of the vagina, may be brought up between the finger in the rectum and the thumb in the vagina as thickened, indurated, and doughy masses. The vaginal cellulitis shows as a slightly elastic mass firmly fixed to the pelvic wall, smooth and glistening, the vaginal rugæ obliterated.

Hysterectomy in Puerperal Sepsis.—In advocating the performance of hysterectomy in certain selected cases representing the suppurative group of puerperal septicemia, Baldy[2] remarks that with tubes and ovaries distended with pus abdominal section and removal of the offending organs become necessary; if, in addition, the broad ligaments and pelvic floor be infiltrated and contain pus, while it is true that the entire area of infected and suppurating connective tissue cannot be removed, those who have performed total hysterectomy in this condition will recall the fact that a large proportion of the infiltrated area has been reached, and that the remaining portion is in every direction opened up and left in a most favorable condition for drainage. No method of incision, either single or multiple, will so thoroughly lay open and afford such thorough drainage of the suppurating tissues as the removal of the entire uterus. The plea that when once the infection has passed into the connective tissue the disease has ceased to be a local one, and has become general and beyond reach, is not absolutely true, at least in the reasonably early stages. The disease is essentially a local one until such time as the blood is so broken down by the absorption of septic matter as to longer preclude the possibility of life. When that point has been reached is the difficult problem to be solved. If the physician decide that, provided there be no more absorption of sepsis, the patient's chances for life are good, it would then seem that instead of wasting invaluable time in "building up" the woman or "waiting," it becomes his duty to see that there be no more absorption, or, if perchance absorption cannot be stopped

[1] Buffalo Med. Jour., July, 1895.

[2] Am. Jour. Obst., July, 1895.

altogether, that at least it be minimized. Total hysterectomy is the best way of accomplishing this object, and, as a rule, the best time for performing this operation is within the first week or two. Equally, if not more, difficult cases to deal with are those in which no disease of the pelvic peritoneum, Fallopian tubes, ovaries, or connective tissue is demonstrable by an examination. The absorption of septic material is taking place from the cavity of the uterus, as demonstrated by the absence of all other cause and the presence of purulent and fetid discharges. The so-called diphtheric and gangrenous cases are of this variety. Intrauterine douching, curettage, the free use of pure carbolic acid to the interior of the uterus, and drainage by gauze-packing or otherwise, having failed to bring about a diminution in the high temperature and pulse, there remains nothing short of hysterectomy to put a stop to the disorganization of the blood. The hysterectomy need not of necessity be total, amputation below the internal os being all-sufficient. Twenty cases have been reported by American operators with 7 successes. Cartledge [1] concludes that the time for hysterectomy in true puerperal infection is after thorough local and general treatment has failed to stay the progress of the disease. If successful, the nonoperative treatment will arrest the disease in 3 days. The operation he would prefer to do by the vaginal method. Holmes [2] admits that hysterectomy alone, in certain cases of puerperal sepsis, will accomplish the removal of the infected tissues. He states that in 101 cases of sepsis treated by Braun-Firnwald curetting failed 5 times, and in these 5 cases there is every reason to believe that hysterectomy would have been effectual in saving the lives of the patients. The question of treatment of puerperal sepsis by hysterectomy is one that vitally concerns at least 214 persons a year in Chicago, 208 persons a year in New York City, and 78 persons a year in Brooklyn. In conclusion, he claims that the indications for hysterectomy in puerperal sepsis seem to be these: (*a*) Curetting and uterine irrigation and tamponade have failed; (*b*) Peritonitis or pelvic cellulitis is present; (*c*) Hopeless localization of infection outside the pelvis cannot be found. The operation may not be helpful in the course of diphtheric vaginitis and endometritis, in cases of rapid early infection, and in cases of septic phlebitis reaching outside the pelvis. The method of operating will depend upon the size of the uterus, upon the condition of the uterine tissues, and upon the experience or choice of the operator. Holmes would also prefer in most cases the vaginal route.

Albert H. Tuttle [3] concludes that while the indications for extirpation of the uterus for puerperal sepsis must be extremely rare, there are conditions found at times that are good and true indications for hysterectomy. The extension of the operation, however, must be extremely limited until our knowledge of the intimate relations between the types of infection, their clinical manifestations and pathologic lesions, is better formulated and good enough to enable one to make a sufficient diagnosis. Baldy [4] remarks that it is a well-known fact that the vast majority of cases of puerperal infection

[1] Am. Gynæc. and Obst. Jour., Jan., 1896.
[2] Jour. Am. Med. Assoc., Nov. 23, 1895.
[3] Boston M. and S. Jour., Dec. 5, 1895.
[4] Phila. Polyclinic, Nov. 9, 1895.

recover under medical treatment, including the minor surgical treatment by curettage. It is equally well known that a certain smaller proportion of patients die of septicemia within a week or two from the time of delivery. It is in respect to the treatment of this latter class of cases that differences of opinion are found among experts. It will be noted, however, that while a few denounce any major surgical interference in any case at any stage of the disease whatever, a large majority of those competent to judge advocate hysterectomy in certain well-defined cases. It may be concluded that hysterectomy is the treatment demanded in all cases of puerperal septicemia in which it can be demonstrated that there is no suppuration of either the Fallopian tubes, the ovaries, or the peritoneum, when the patient's life is seriously threatened, other approved methods having been tried and failed, and in all cases in which the uterine walls contain pus-pockets, whether there be other foci of suppuration or not. Early decision and operation are necessary to success. Hirst[1] considers that the present status of hysterectomy for puerperal sepsis may be thus defined: For the acute rapidly progressive and virulent form of sepsis early in the puerperium (almost always a mixed infection of the endometrium) the operation so far has been a failure; for suppurative and ulcerative metritis, usually but not necessarily appearing in the latter part of the puerperium, it has been a brilliant success. Penrose[2] reports a case of hysterectomy for acute puerperal sepsis in a young woman of 24 years, the operation being performed on the fifth day; recovery followed.

Vaginal Incision for Pelvic Disease.—Much has been written upon this subject during the year, and preeminent among the papers upon this so-called epidemic of transvaginal surgery are those of Henrotin,[3] Norris,[4] Gilliam,[5] A. Martin,[6] Polk,[7] Garceau,[8] Vineberg,[9] Montgomery,[10] and Long.[11] Norris, in opposition to the most ardent advocates of vaginal section (or, as it has been termed by Dührssen and A. Martin, *anterior kolpotomy*), who consider it applicable to all possible intrapelvic diseases, and even to intra-abdominal tumors, believes that its legitimate field will be more restricted. The operation may be indicated for long-standing cases of inflammatory pelvic diseases, in which there have been repeated attacks of peritonitis, with dense adhesions and pus-formations that may have spontaneously opened into the bowel, bladder, or vagina. Evacuation and drainage here will often be useful as a preliminary measure, to be followed, if need be, by an abdominal section after the patient has gained in strength and flesh. To attempt by the vaginal route to remove diseased adherent organs in such cases is dangerous, urinary and fecal fistulæ often following these operations. Norris believes that it is possible that before long local treatment for a displaced and adherent uterus, tube, and ovary will be discarded, and that the organs will promptly be examined and

[1] Univ. Med. Mag., Dec., 1895.
[2] Am. Jour. Obst., May, 1896.
[3] Am. Jour. Med. Sci., Oct., 1895.
[4] Univ. Med. Jour., Dec., 1895.
[5] Jour. Am. Med. Assoc., Aug. 31, 1895.
[6] Brit. Med. Jour., Jan. 4, 1896.
[7] Med. News, Jan. 4, 1896.
[8] Jour. Am. Med. Assoc., Aug. 24, 1895.
[9] Am. Med.-Surg. Bull., Mar. 7, 1896.
[10] Am. Jour. Obst., Dec., 1895.
[11] Am. Gyn. and Obst. Jour., Jan., 1896.

replaced through an incision in the vaginal culdesac. It is probable, also, that fibroids, especially those capable of passing the inferior strait of the pelvis, will always be enucleated or morcellated and be removed through the vagina, and that the same method will be employed in many cases of tubal and ovarian disease. The remarkable work of Péan, Ségond, Jacobs, and others, by vaginal section for pelvic inflammatory diseases, has led gynecologists the world over to a serious consideration of the advantages claimed for vaginal hysterectomy in dealing with the various intrapelvic inflammatory diseases for the cure of which abdominal section has hitherto been applied. Jacobs has given the mortality in 816 cases of suppurative diseases of the appendages treated by vaginal hysterectomy at the hands of 6 operators as 4.5%. In 584 cases of non-suppurative diseases of the appendages the mortality was 1.7%. Henrotin, after observing the methods adopted by the leading gynecologists of this and other countries, remarks that "a patient who has not had her abdomen opened, who has no scar left that she can see, will have been less profoundly shocked, will be conscious of less traumatism, will feel easier and quieter, and will in most instances be more quietly, completely, and perfectly cured. This is the observation of men who have performed large series of vaginal hysterectomies, and who at the same time frequently perform abdominal sections." The few cases of sepsis that occurred while the operation was still in its experimental stage have almost entirely disappeared, since the value of careful packing of gauze in the pelvis beyond the ends of the forceps has been recognized. The seat of the operation is thereby almost entirely shut off from the general cavity, the stumps of the broad ligament and the instruments being really in the vagina. Infected tissue, he claims, is not left behind more frequently by the vaginal than by the abdominal method. The danger of abdominal operations in cases in which there exist openings into the rectum or bladder, discharging the most foul pus through these organs at irregular intervals, is well recognized. It is in such cases that the French have insisted upon the propriety of removing the uterus, and, if possible, the appendages, through the vagina. This affords a straight, large, and efficient channel for drainage, which in almost every instance sooner or later completes the cure. Henrotin urges the adoption of the vaginal operation for the following reasons: 1. In the variety of cases to which it is particularly applicable it is less dangerous than abdominal section. 2. It avoids to a great degree the contamination of the general abdominal cavity by a less disturbance of the exudate, and consequently protects the unaffected portion. 3. It produces less shock, and is therefore applicable to patients much debilitated by the existing disease. 4. It does away entirely with the abdominal scar, and therefore with the liability to hernial protrusion. 5. In common with hysterectomy by other methods, it results in a more certain, rapid, and complete cure than mere removal of the appendages. 6. It is decidedly preferable and less dangerous in cases complicated with fecal, urinary, and vaginal fistulous tracts. 7. It has proved successful in many cases in which abdominal section in the hands of the most skilful operators has failed. Henrotin concludes: "To see Baldy, Howard

Kelly, Baer, Krug, Eastman, and many others remove a fibroid tumor by our modern perfected abdominal method is, indeed, almost perfection; but to see Ségond or Jacobs do the same with a loss of scarcely a tablespoonful of blood, and bearing in mind that not a ligature will remain within or a scar be visible, is almost a revelation."

Gilliam [1] remarks that sepsis is less frequent in transvaginal surgery, because (1) the pelvic peritoneum is better able to cope with germs; (2) the route of invasion is less direct and against the tide of outflowing serum; and (2) the germicidal powers of the splanchnic viscera are unabated. Abdominal drainage, on the contrary, is against gravity, and the animal fluids coating the tube or filling the meshes of the gauze afford an excellent culture-medium for stray germs that naturally make their way downward or inward. Gilliam believes that vaginal surgery has a sphere of its own. It cannot aspire to supplant abdominal surgery nor yet in any large measure trench upon it. The dangers of the operation, according to Long,[2] are opening a viscus or blood-vessel and opening the peritoneum, thereby infecting it. Polk [3] believes that the vaginal section will always serve as subordinate to the abdominal, even though it diminish the frequency of the latter one-half to two-thirds. He remarks that as the indications for or against depend largely upon the dimensions of the diseased area or growth, one must admit that the earlier the operation is done the greater the chance for vaginal section. Since February, 1892, 72 vaginal sections have been performed at Bellevue Hospital, with 3 deaths, covering every species of disorder for which the operation has been advocated. Polk tabulates the conditions favorable, on the one hand, to vaginal section, and on the other to abdominal section in diseases of the female pelvic organs, as follows:

Vaginal Section.	*Abdominal Section.*
A shallow and wide pelvis in a thin woman.	A narrow and deep pelvis, especially if deformed.
Explorations of the pelvis.	Explorations above the true pelvis.
Visceral adhesions in the true pelvis.	Visceral adhesions in false pelvis or above.
Displaced and adherent uterus.	Large ovarian cysts, especially multilocular, with colloid contents.
Smaller ovarian cysts, especially the intraligamentous and parovarian.	Large fibroids, especially the firm and hard.
Smaller fibroids, especially the soft.	Extrauterine pregnancy at the time of rupture and at term.
Extrauterine pregnancy up to the 7th month and after death of the fetus.	Extrauterine pregnancy, with the tumor wholly above the brim of the pelvis, and not in relation with the uterus.
Pelvic hematocele.	Pelvic abscess pointing upward.
Puerperal hysterectomy.	Conservative operations under conditions unfavorable to vaginal section, such as a narrow and deep or a deformed pelvis that is contracted.
Acute inflammation of the appendages, with peritonitis involving the culdesac.	

[1] Loc. cit. [2] Loc. cit. [3] Loc. cit.

Vaginal Section.	*Abdominal Section.*
Inflammatory destructive disease of the appendages, including tubercular disease.	
Pelvic abscess pointing downward.	
Conservative operations on appendages that lie in the true pelvis.	

Vineberg reports the first fatal result after anterior kolpotomy. A. Martin[1] has operated on 149 cases without a death; Aman[2] has had 43 cases, Mackenrodt 30 cases—making a total of 264 cases, with 1 death, giving a mortality of 0.37%. In operating Vineberg prefers a longitudinal incision in the anterior wall instead of a transverse incision either in the anterior or posterior fornix, because it affords more room; it cannot wound the ureters or the rectum; it is attended with less hemorrhage; and it affords the best method of doing a vaginal fixation when there is an accompanying backward displacement of the uterus. Burrage[3] regards the vaginal incision as adapted only to cases of cystic ovaries; prolapsed and adherent ovaries and tubes; peritonitic adhesions that limit the mobility of the uterus; small ovarian and parovarian cysts; mild grades of salpingitis; and for diagnosis in doubtful cases. When the inflammation of ovary and tube has progressed to the extent of forming a hard tumor surrounded by exudate, and when the disease is high up in the pelvis, the proper operation is either abdominal section or vaginal hysterectomy. Watkins[4] states that the operation is indicated—(1) When the condition of the patient is such as to make abdominal section extremely dangerous. (2) When the abscess is large, of long standing, and situated low in the pelvis, and when the patient gives a history of peritonitis. (3) When abdominal section reveals extensive and firm intestinal adhesions. (4) When the abscess is on the floor of the pelvis and is complicated by rectal fistulæ. (5) Vaginal section may be indicated for the separation of adhesions that fix the ovaries and tubes on the floor of the pelvis, and for examination of the ovaries and tubes. (6) Puerperal abscess. These abscesses frequently involve the tubes and ovaries, and satisfactory results usually follow thorough drainage of them. Quénu[5] says that a good general rule is, if the uterus be movable, to perform abdominal section.

A. Martin,[6] who has performed anterior kolpotomy more frequently than any other operator (109 cases), adopts the following technic (see Fig. 116): The patient is placed in the dorsal position, with the legs raised on either side. A speculum being introduced into the vagina, the uterus is fixed with a pair of Orthmann's forceps, a combination of a uterine probe and volsella which grasps the anterior lip of the cervix so that one can draw down the cervical portion of the uterus to the vaginal introitus. Another pair of volsella forceps are fastened just under the orifice of the urethra, about 3 in. from the cervical opening. The anterior vaginal wall is pulled upward; a fold is raised which is to be incised vertically and peeled off laterally from the surface of the blad-

[1] Berl. klin. Woch., 1896, No. 1.
[2] Münch. med. Woch., 1895, No. 45.
[3] Boston M. and S. Jour., Jan. 30, 1896.
[4] Am. Jour. Obst., Aug., 1895.
[5] Presse méd., July 6, 1895.
[6] Loc. cit.

der and cervical body. Hard fibers will be seen above the vaginal incision, which are to be divided. The upper border is then pushed upward with the finger, separating the loose tissue between the bladder and uterus, thus carrying the former up out of the way behind the symphysis pubis. Occasionally the bladder is distinctly made out, at other times it is never seen. The peritoneum

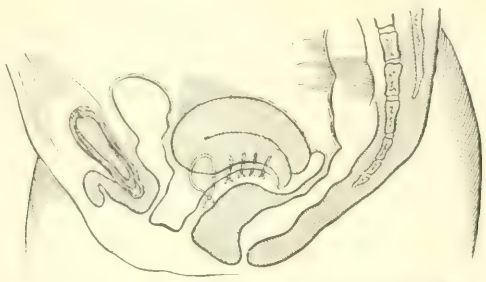


FIG. 116.—Anterior kolpotomy: method of suturing (Berl. klin. Woch., 1896, No. 1).

is found in the form of a fold between the bladder and uterus, recognizable by its pellucid appearance; this is to be opened, when the abdominal cavity and contents are exposed to view. After treating the pelvic condition the wound is closed in the following manner: The uterus and adnexa are to be replaced in the abdominal cavity by pressing on the anterior uterine surface. A strong catgut suture is to be carried with a curved needle through the upper end of the vaginal wound, the cellular tissue at the base of the bladder, the peritoneum, and the anterior uterine wall near the fundus, taking a good hold of it, and out again on the opposite side in the same manner, and tied. Two other sutures close the vaginal wound, connecting it with the anterior surface of the corpus uteri; a fourth the cervix. A running catgut suture is used to close the vaginal wound more exactly between these deep sutures. Martin recommends the operation in cases of myomatous tumors, which, if of large size, may be removed by morcellement; to replace movable retroflexed uteri, which may then be retained by vaginal fixation; to break up peritoneal adhesions fixing the uterus; for procidentia (in these cases a part of the vaginal wall is excised to make it of the proper length, the uterus is fixed in the upper part of the vaginal wall, which is very little disturbed, and the weight of the uterus is thus taken from the remaining portions, retaining it in its normal position); for opening cystic ovarian tumors and performing ovarian section; and in treating diseases of the tubes.

Dührssen,[1] in performing vaginal hysterectomy for extensively diseased adnexa, overcomes most of the difficulties arising from the narrowness of the vaginal passage by incision of the vagina and perineum performed as follows: A point is marked on the skin halfway between the anus and the tuberosity of the ischium. The sides of the vulva are then retracted; a knife is inserted at the posterior commissure of the vagina and carried backward and outward to the point previously marked on the skin. This incision cuts the levator ani

[1] Arch. f. Gyn., xlix. No. 2, p. 324.

muscle and opens the ischiorectal fossa. Hemorrhage is stopped by pressure of a broad retractor. The incision is closed by a row of silkworm-gut sutures passed through the skin and muscle, and a row of catgut sutures in the vagina. This incision usually gives plenty of room, but more space may be obtained by multiple superficial incisions of the edges of the vaginal wound or by a longitudinal incision of the anterior wall of the vagina, and separation of the vagina from the bladder. These incisions remove all resistance of the soft parts, and allow the removal of a uterus the size of a child's head, without previously cutting it in two or without using forceps for stopping the hemorrhage.

There are various other methods of performing this operation, depending much upon the condition found in each particular case. *Method of Péan:* If the uterus is not fixed and small, he employs the ordinary clamp method. When there are adhesions, pyosalpinx, etc. the uterus is removed by morcellation—*i. e.* by making transverse incisions in the uterine wall after clamping with forceps. The tubes and ovaries are then separately removed. *Method of Ségond:* After separating the cervix, dissecting back the bladder, and ligating the uterine arteries, conical portions of uterine tissue are excised until the fundus is reached, when the surrounding tissue and upper portion of the broad ligaments are ligated. *Method of Doyen:* When Douglas's culdesac has been opened and the bladder displaced, the anterior wall of the uterus is incised in the center and separated and the tissue on each side is clamped. The incising, separation, and clamping progress from below upward until the fundus is reached. If the uterus is very large, a V-shaped portion of the anterior uterine wall is excised. The cervix is drawn progressively downward, clamps are applied to the broad ligaments, and the uterus removed. *Method of Müller-Quénu:* This differs from the foregoing in that the uterus is completely divided into two halves, anterior to posterior. In all 4 methods, after opening the posterior vaginal vault, a thorough bimanual examination is made to determine the condition of the tubes and ovaries. If the vagina is too small, a lateral incision is made. Drainage is unnecessary except when there is pus. Drainage by partial resection of the uterus is condemned. The after-treatment is as usual. Complications, such as injury to the intestines, bladder, and ureters, are not more common than in abdominal section. Secondary hemorrhage and prolapse of the vagina between the clamps are uncommon, and if a fistula results it is easily repaired. The mortality of vaginal hysterectomy for suppurative adnexal disease is from 8.03% to 12.5%. Bourdon's mortality with this method of treatment for pyosalpinx and ovarian abscess is 3.8%, and in noninflammatory diseases he has not lost a case. The final results are good. Ségond, with 128 cases, reports 118 perfectly well.

Interesting cases of *abdominal section* are reported by Hauck,[1] Cullingworth,[2] Kousmine,[3] Kraft,[4] Schwartz,[5] Edge,[6] Malcolm,[7] Gersuny,[8] William

[1] Ann. of Gyn. and Pæd., Sept., 1895.
[2] Ann. of Gyn. and Pæd., Oct., 1895.
[3] Arch. de Tocol. et de Gynéc., No. 9, 1895.
[4] Centralbl. f. Gynäk., No. 36, 1895.
[5] Arch. de Tocol. et de Gynéc., Feb., 1895.
[6] Lancet, July 27, 1895.
[7] Med. Press and Cir., July 17, 1895.
[8] Centralbl. f. Gynäk., No. 2, 1896.

C. Wood,[1] Prince,[2] Reifsnyder,[3] Owens,[4] Kahn,[5] and Weber.[6] Hauck reports a successful abdominal section with appendicectomy in a child 16 months old, the symptoms being those of intestinal obstruction caused by a coil of small intestine encircling the ascending colon and drawing it up toward the liver. Successful ovariotomies in aged women are reported by Owens and Kraft. Owens's patient was in her 87th year, the oldest reported case. An interesting feature of this case is that 6 years previously the doctor had removed from her right side a parovarian cyst, which he had shelled out of its nest. Section showed that the new growth arose from the right ovary, instead of from the left, as was supposed. Kraft's patient was 84 years old; her tumor was of 7 years' growth, and had been tapped several times. Reifsnyder describes 2 cases of ovariotomy performed on native Chinese women in the Margaret Williamson Hospital, Shanghai, both recovering. The first patient was 23 years old, and her tumor weighed 80 pounds. The second patient was 25 years of age; she married at 19, and soon afterward her abdomen began to enlarge. She had never been tapped. She was 4 feet 8 in. in height, and the circumference at the umbilicus was 5 feet, $7\frac{3}{4}$ in. She passed about 16 ounces of urine in 24 hours, free from albumin; its specific gravity was 1026. Her appetite was good and the bowels acted once or twice daily. She had been unkindly treated as a sterile woman unfit for domestic work. After numerous precautions ovariotomy was performed. Chloroform was given; her head and shoulders had to be somewhat elevated; she took but little of the anesthetic; 88 quarts of fluid were removed; the tumor consisted of 1 large and 1 very small cyst; there were free adhesions superiorly. The empty tumor weighed $6\frac{1}{2}$ pounds. There was no ascitic fluid in the abdominal cavity. The pedicle was long and about $2\frac{1}{2}$ in. broad. The abdomen was washed out, then the wound closed with 12 silk sutures. There was much shock at first. After the first day she passed urine voluntarily, and her bowels were moved 41 hours after operation. On the second day there was flatulent distention, the pulse rising to 102. Rochelle salts were given. Her second night was the worst; she had 2 hypodermic injections of digitalin ($\frac{1}{100}$ gr.), brandy by the mouth twice, one turpentine enema, and a capsule of turpentine taken by the mouth. Afterward she did well. Her weight 2 months after the operation was 92 pounds.

Prince reports the *calcification of an ovary* lying free in the pelvic cavity of a woman 40 years of age. It was situated posteriorly to the uterus, and had become detached, together with the accompanying tube (the left), probably from some constricting agency. All vestige of any constricting band or of the amputated tube had disappeared. Weber's case was one of femoral hernia of a cyst of the broad ligament, which he believed had its origin in the so-called duct of Gärtner. The femoral ring was not enlarged, the cyst-wall having grown or been forced into and partly through the femoral canal, result-

[1] N. Y. Med. Jour., Oct. 26, 1895.
[2] Med. Rec., Oct. 5, 1895.
[3] Buffalo Med. Jour., Oct., 1895.
[4] Lancet, Mar. 2, 1895.
[5] Med. Rec., Oct. 5, 1895.
[6] Am. Jour. Obst., Sept., 1895.

ing in an hour-glass formation. Kousmine reports a large tumor of the iliofemoral region caused by a hernia of the Fallopian tube in a woman 36 years of age. Only 5 other such cases are reported. Edge[1] reports a case of postpartum tuboovarian abscess situated high on the left pelvic wall and in the left iliac fossa; Douglas's pouch was empty. A fecal fistula followed the operation, gradually closing spontaneously. Wood[2] calls attention to a hitherto undescribed symptom of pyosalpinx—namely, a severe pain over the region of the liver, which has been present in all of his cases.

F. B. Robinson[3] reports 45 cases upon which he has performed his new operation of removal of the appendages and ligation of the uterine artery to the uterocervical junction. The utility of the operation resides in the following points: 1. It checks hemorrhage; 2. It arrests menstruation; 3. It elevates the uterus; 4. It causes shrinkage of the uterus; 5. It avoids the removal of uterine myoma; 6. It avoids vaginal hernia. Edebohls[4] prefers the rectus muscle as the site for the abdominal incision.

[**The ligature in abdominal section** still commands much attention from operators.] Penrose[5] objects to the methods of ligaturing commonly employed, on the grounds that the sutures are liable to slip; there is difficulty, or impossibility in some cases, of removing all the ovary and tube; the broad ligament is puckered up and made more tense than normal, and may for this reason cause subsequent pain and discomfort; and an unnecessary amount of tissue is strangulated. These objections may all be avoided by ligating the distal and the proximal portions of the ovarian arteries with distinct ligatures, and then cutting away the tube and ovary. The first ligature is passed through the broad ligament near the pelvic wall, securing the proximal portion of the ovarian artery; the second ligature is passed through the broad ligament at the uterine cornua, securing the distal portion of the artery. The second ligature may include the Fallopian tube if there be no disease of the isthmus, or it may be passed immediately beneath the tube if it be necessary to exsect the tube from the uterine cornua. There is no tendency to retraction or slipping; the minimum amount of tissue is included in the ligatures; all ovarian tissue can be removed; and there is no traction whatever upon the scar. Noble[6] prefers closing the abdominal wall by means of buried silkworm-gut sutures placed at the level of the aponeurosis, thus closing the peritoneum, subperitoneal fat, recti muscles, and aponeurosis. The skin and subcutaneous fat are then brought together by superficial sutures introduced down to the aponeurosis, so that dead spaces shall not be left in the abdominal wall. His results with this method have been very satisfactory. Edebohls,[7] however, who formerly strongly advocated the use of the buried ligature, now repudiates the buried *permanent* ligature, and employs buried chromicized catgut instead. Longyear[8] has employed buried sutures and ligatures of kangaroo

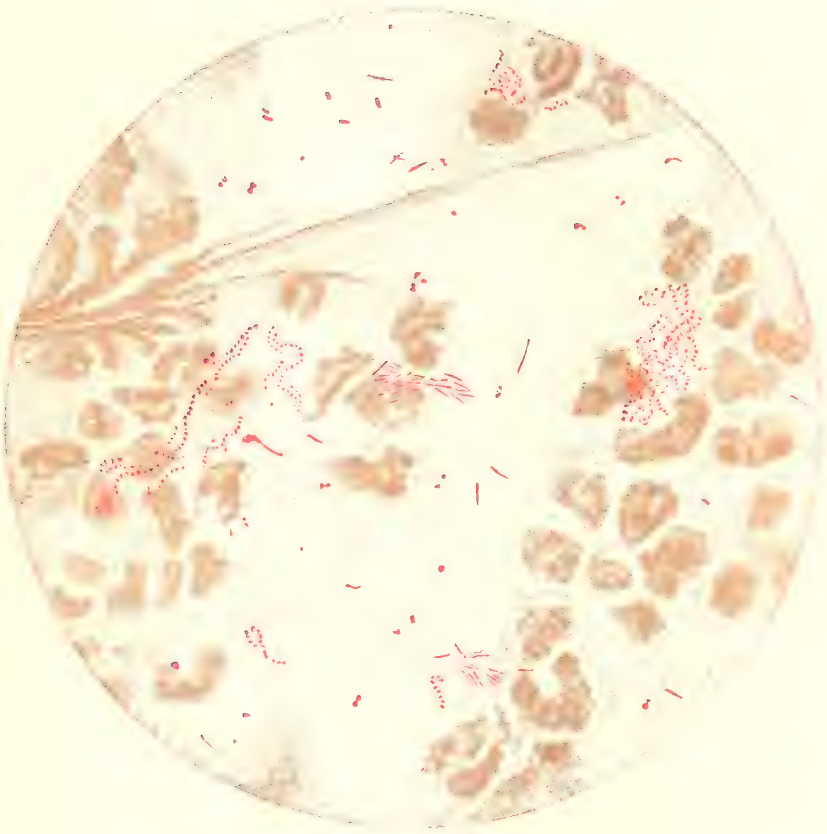
[1] Loc. cit. [2] Loc. cit. [3] Med. News, Aug. 17, 1895.
[4] Am. Gyn. and Obst. Jour., May, 1896. [5] Am. Jour. Obst., Aug., 1895.
[6] Ibid., Dec., 1895. [7] Am. Gynæc. and Obst. Jour., May, 1896.
[8] Physician and Surgeon, July, 1895.

tendon for the past 4½ years in 57 cases of abdominal section, with and without drainage, and he has yet to see his first case of postoperative hernia. He has also employed the tendon in a large number of operations for ruptured perineum and in a number of cases of herniotomy.

Drainage.—[The question of drainage after abdominal section, while practically settled, still gives occasion for considerable controversy.] Writes Senn:[1] "Drainage of the abdominal cavity is an expression of the present imperfect state of surgery." He remarks that it should be limited to appropriate cases, and should be employed as little as possible. When he drains for pus, whether through the abdominal or pelvic incision, he invariably resorts to tubular drainage, and for the removal of serum combined drainage; while capillary drainage by means of a tampon is reserved for cases in which it becomes necessary to arrest hemorrhage by this method. Van Hook[2] prefers capillary abdominal drainage for several reasons. A very great advantage of the gauze drain lies in the fact that its presence, by favoring the destruction of a certain number of peritoneal cells and of white corpuscles, brings about a rapid coagulation that materially favors the arrest of hemorrhage. The gauze has an important advantage, also, in that it may be harmlessly pushed in various directions in the abdominal cavity. The gauze should be left in the abdominal cavity as long as the discharge is free. The gauze should be as actively "hydrophile" as possible, to prevent its acting as an obturator instead of a drain. The strips of gauze should be left long in order that the fluid from the peritoneum may be delivered with great freedom and rapidity into the dressings. Duret[3] has recently successfully employed aspiration according to the method suggested by Lawson Tait—namely, by a hydrocele-syringe every 4 hours for 2 or 3 days. Grandin,[4] Mallett,[5] and Watkins[6] favor drainage by the vaginal route. Watkins mentions as the advantages of such a method that the most dependent portion of the abdomen is drained; the drainage is downward; the surface that usually requires drainage is in more or less close proximity to the vagina; the danger of hernia is diminished; fewer adhesions must of necessity occur, as the abdominal cavity is kept more free from exudates; there is less danger of infection of the abdominal wound; when the gauze drain is employed much less pain is occasioned upon removal of the drain; and there is less danger of infection in the after-treatment of the patient. He regards the abdominal route as preferable when the surface to be drained is near the abdominal incision. Penrose[7] determines when to employ drainage by bacteriologic examination of the pus during the operation whenever intraperitoneal rupture of the abscess takes place. If the abscess can be removed without rupture, drainage is unnecessary; if rupture occur and the contents are sterile, the pus is merely sponged out and the abdomen closed; if rupture occur and the contents are

[1] Am. Gyn. and Obst. Jour., Mar., 1896.
[2] Ibid.
[3] La Sem. méd., 1895, No. 40, p. 342.
[4] Am. Med.-Surg. Bull., Feb. 15, 1896.
[5] Am. Jour. Obst., Aug., 1895.
[6] Am. Gynæc. and Obst. Jour., Mar., 1896.
[7] Am. Gynæc. and Obst. Jour., Aug., 1895.

PLATE 6.



Appearance of a drop of pus examined during operation (Am. Gyn. and Obs. Jour., Aug., 1895).

septic, the pelvis is washed with distilled water or sometimes with a 1 : 2000 bichlorid solution, and is drained with the glass tube or with gauze. In the examination cover-glass preparations are made, and are fixed in the flame of an alcohol lamp, and stained with carbol-fuchsin. A Leitz one-twelfth immersion lens is used. The illustration (see Plate 6) shows the microscopic appearance of a drop of septic pus examined during one of his operations.

Czempin[1] notes that drainage is being less and less employed each year. He refers to the method advised by Sänger (the glass drain) and Mikulicz (the iodoform-gauze drain), and also to the indications for drainage as pointed out by Veit, Olshausen, and Martin. He notes that Sänger has practically discarded drainage; that Veit believes the indications are very few; and that opinions are so varied that there are no absolute rules to follow in any particular case. Czempin has found that each year fewer cases require the drainage-tube. From his observations the cases in which drainage may be indicated are divided into two great groups: *First*, operations upon noninfectious tumors with unfavorable complications, caused by the condition of the relations of the operation wound. *Second*, operations upon infectious tumors or those thought to be infectious, and operations complicated through injury to the intestine, the escape of pus or decomposed fluid. First, complicated noninfectious operations. To this group belong (*a*) intraligamentary-developed new growths resulting in the necessary extensive separation of the pelvic connective tissue; (*b*) where the new growth has extensive adhesions with neighboring organs and the parietal peritoneum, therefore necessitating extensive injury to the peritoneum. Under these headings Czempin reports a series of cases with results that vary too much to be of practical use. In the first group the separation of the pelvic connective tissue and the extensive wound results in the forming of the best culture-medium for infectious organisms, and that infection takes place either through faulty technic, infection from without, or through intestinal bacteria the result of injury to the intestine. He says that it is doubtful whether drainage does good in these cases—that the resulting exudate is quite as readily absorbed and eliminated by nature. As regards the second group of cases, he refers to the statistics of Zweifel of 103 adnexa operations, with 1 death, where the rubber drainage-tube was employed, but says it proves nothing. The method of Schauta, Wertheim, and Fritsch (the microscopic examination of pus during operation) he believes has the correct object, but is not positive; that the organisms may not be virulent, they may be few in number and not found, and a certain number of cases are thus unnecessarily drained. The use of drainage complicates the operation, often causing suppuration in the abdominal wound, fistula, and hernia. Finally, he concludes that *the results in complicated abdominal section are only rarely improved by the use of drainage, and that in the greater number of cases in which it is used it is not essential.* If virulent organisms are present, it can scarcely save life; if the virulence is extinct, it is not necessary. When in the removal of a noninfectious new growth the pelvic connective tissue is separated, drainage is not only unneces-

[1] Monatsh. f. Geburtsh. u. Gynäk., Supplement to Bd. ii., 1895.

sary, but often does harm. When there is a closed-off, acute inflammatory process in a tumor in the peritoneal cavity, and in its removal pus escapes into the peritoneal cavity, infection is to be feared. Particular caution should be taken that the least amount of the peritoneum is infected, and the material should be carefully removed with the sponge. The use of the iodoform-gauze tampon does not physically or chemically influence the result. The opening of acute inflammatory connective tissue in adnexa operations is very dangerous. Whether drainage can save the patient's life is questionable. In such cases he believes complete hysterectomy gives the best results. In adnexa operations he advises that the operation be performed 6 months after the last exacerbation. In cases in which the pelvic connective tissue is widely separated in the removal of a tumor (hematoma of the broad ligament) drainage is not necessary. In very difficult operations, where the pelvic connective tissue is widely separated and the case is septic, the best results are gained by complete hysterectomy and drainage with iodoform-gauze through the vagina.

Conservative Pelvic Surgery.—The adherents of the conservative methods of pelvic surgery continue to report favorable results after the operations. In 30% of his cases Delange[1] states that pregnancy subsequently occurred. Donnef[2] thinks that resection or ignipuncture is indicated in the case of every young woman who presents evidences of chronic oophoritis associated with a healthy condition of the uterus and tubes. When the uterus is diseased or the patient is near the climacteric, hysterectomy is preferable. Mathaci[3] recommends resection of the ovary in all cases of ovariotomy in which the opposite ovary contains retention-cysts too large or too numerous to be treated by ignipuncture, or even when a small dermoid cyst is present not involving the entire ovary. Exceptionally, healthy stroma may be preserved in the case of a small proliferating glandular cystoma. If the patient have passed the climacteric or if there be a suspicion of malignancy, the ovary should be entirely removed. Mathaci reports 6 cases of ovariotomy with resection of the opposite ovary, 5 of the patients subsequently conceiving and bearing living children. Gersuny[4] has successfully incised a tube-sac upon the surface toward the ovary, and into this opening has introduced the ovary, which was held in place by 6 fine interrupted sutures; a normal pregnancy followed within a few months. Nothing is said as to the symptomatic cure of the case. Henrotin[5] for the past 2 or 3 years has been in the habit of making an incision behind the uterus and digitally exploring the pelvis in all cases in which the disease-process has extended beyond the cavity of the uterus. He has done this 27 times with success. He makes his incision moderately circular, close to or rather slightly on the posterior surface of the cervix, and dissects back the vaginal mucosa through the cellular tissue to a point beyond which the wounding of the uterine artery seems improbable. Any pus that may be present is evacuated, and the abscess-cavity then

[1] Arch. de Tocol. et de Gynéc., 1894, No. 3. [2] Centralbl. f. Gynäk., 1895, No. 33.
[3] Zeit. f. Geburtsh. u. Gynäk., Bd. xxxi. H. 2. [4] Centralbl. f. Gynäk., No. 2, 1896.
[5] Chicago Med. Recorder, July, 1895.

explored for additional pus-collections in the neighborhood. The finger only is used for this purpose. A gauze-packing is then introduced and retained for from 3 to 5 days.

Complications during and after Abdominal Section.—1. *Peritoneal Adhesions.*—Tappey,[1] quoting Riedel of Jena, mentions the following causes of adhesion in the abdominal cavity: Contusion of the abdomen; ulcer of the stomach; inflammation about the gall-bladder and ascending colon; conjoined inflammation of the gall-bladder and vermiform appendix; inflammation of the vermiform appendix alone; inflammatory processes in the colon; and lipomata that have become detached from their pedicles within the peritoneal cavity. In addition to the foregoing, adhesions are found in the pelvic cavity caused by inflammation of the ovaries or tubes, or both; inflammation of the uterus; inflammation of and about the rectum; and inflammation of the bladder. He further states that abdominal surgery has well established the fact that many of the pains, vague, uncomfortable feelings, and so-called dyspepsias are caused by adhesions of various organs in the abdominal and pelvic cavities. Bryon Robinson[2] believes that peritoneal adhesions are quite abundant after abdominal section. In 200 autopsies made by him he states the percentages of adhesions in the regions which he terms major regions of peritonitis as follows: (*a*) In the mesosigmoid, 80%; (*b*) In the cecoappendicular apparatus, 72%; (*c*) In the pelvis, 75%; (*d*) Around the gall-bladder, 65%. Peritoneal adhesions indicate section only when they produce definite symptoms. An operation is seldom required when the adhesions surround solid or fixed organs, but the peritonitic adhesions in the pelvis that demand operation are those involving loops of small intestines, sigmoid, bladder, or Fallopian tubes.

2. *Intestinal Obstruction.*—Rosner[3] regards intestinal obstruction after abdominal section as one of the most dangerous and least avoidable of all the complications. He claims to have greatly lessened the danger of this complication by means of a sterile sodium salt-solution (calcium sodium carbonate, 2.50 parts; sodium chlorid, 7.50 parts; water, 1000 parts). Under its use even mild laxatives were not required, the patient having natural passages; also vomiting, pain, meteorism, and other symptoms were usually absent or but slightly marked.

3. *Embolism.*—Baldy[4] regards embolism after abdominal section as a complication of great consequence, secondary only to septic peritonitis and hemorrhage in importance. Most commonly the left leg is affected. The attack begins, as a rule, about the end of the third week after the operation, at a time when the patient is in apparently perfect health and about to leave her bed. Baldy thinks that the complication is not a septic one, nor does it follow any particular lesion or operation. He reports 3 deaths from this cause, and Frederick[5] 1 death.

[1] Am. Gyn. and Obst. Jour., Nov., 1895. [2] Ibid., Dec., 1895.
[3] Therap. Woch., June 2, 1895. [4] Am. Gyn. and Obst. Jour., Mar., 1896.
[5] Buffalo Med. Jour., Aug., 1895.

4. *Pelvic Hematoma.*—Schramm[1] reports a case of pelvic hematoma after oophorectomy. He refers to the hemorrhage that occurs 2 or 3 days after the removal of the uterine appendages as a possible cause of infiltration of blood in the broad ligaments. He condemns the theory of Olshausen, that it is the result of the establishment of collateral circulation after the removal of ovarian tumors, for he has seen it occur most frequently after simple oophorectomy. Hemorrhage occurring in the extraperitoneal cellular tissue he believes must be very rare, since not a single case can be found reported in literature.

5. *Ventral Hernia.*—From an observation of 1000 cases of abdominal section Winter[2] finds that nearly one-third of all the cases suffer from a ventral hernia, although in some cases the hernia does not develop for 1 or 2 years after the operation. In Olshausen's clinic it has been found that the best results are obtained by suturing the abdominal walls by three tiers of sutures—one for the peritoneum, one for the fascia, and one for the skin. In 212 cases sutured by this method only 12 have had hernia.

6. *Fistula.*—Polak[3] reports a case of uteroabdominal fistula after abdominal section for right multilocular ovarian cystoma, which was demonstrated with methylene blue and by direct exploration of the right ureter. Spontaneous closure occurred 40 days after the primary operation. Cestan[4] states that ureterovaginal fistulæ are most frequently produced during the first stage of vaginal hysterectomy. In the treatment of this condition he prefers Bazy's operation.

7. *Emphysema of the Abdominal Wall.*—Meinert,[5] at the meeting on Oct. 14 of the Dresden Gynecological Society, referred to 8 cases reported in the literature (Madlener, Graefe, Winter, and Casperson) of emphysema of the abdominal wall observed after abdominal section, and records an additional case. In the writer's case this condition of artificial emphysema of the abdominal wall appeared after the operation of abdominal hysterectomy for the removal of a fibroid tumor. As in all other cases reported, the Trendelenburg posture had been employed during the operation. In the discussion following Leopold stated that he had seen 6 cases of emphysema of the abdominal wall, and that in every case the Trendelenburg posture had been employed. He has noticed that the emphysema occurred between the peritoneum and muscle (that the peritoneum was sometimes easily separated from the muscle, particularly when there had been considerable manipulation in the peritoneal cavity) and in the subcutaneous areolar tissue. He also believes that it is not harmless, but that it increases the rapidity of the pulse, causes considerable pain, and makes the patient restless. It also may extend into the inguinal region or even, as in 1 case, to the axilla. In those cases in which the disease tends to extend Leopold advises early incision. Brosin said that he had seen 3 or 4 cases under the same conditions as those reported. He observed that healing was always disturbed, and believes there is another form of emphysema due to the forma-

[1] Centralbl. f. Gynäk., No. 34, 1895. [2] La Sem. méd., No. 31, 1895.
[3] N. Y. Med. Jour., Mar. 21, 1896. [4] Gaz. Hebdom. de Méd. et de Chir., Feb. 23, 1896.
[5] Centralbl. f. Gynäk., No. 50, 1895.

tion of gas by bacteria. This last was not sanctioned by Meinert and Leopold. Osterloh stated that this emphysema could be avoided by placing the patient in the horizontal position before closing the abdomen. The greater amount of air would thus be expelled.

After-treatment of Abdominal Section.—[Acetanilid is coming largely into use as a dressing after abdominal section, as well as for wounds of every description.] Francis L. and John R. Haynes[1] speak enthusiastically of the results obtained. The preparations of the drug that are employed are as follows: 1. *Acetanilid glycerol*, made by mixing 40 parts of cold sterilized glycerol with 1 part of acetanilid powder (not crystals), and rubbing thoroughly with a pestle. No heat must be used in making this glycerol, lest crystals should deposit. Should suppuration persist, notwithstanding the use of the glycerol, it may be increased in strength by the gradual addition of a solution of acetanilid in alcohol, 20 gr. to the ounce, commencing by adding 1 oz. of this alcoholic solution to 4 oz. of glycerol. 2. *Boric acetanilid*, made by mixing thoroughly powdered boric acid 6 parts with powdered acetanilid 1 part. It is stored in glass bottles holding 70 gr. Not more than one of these bottles is to be emptied, in the case of an adult patient, in 24 hours. It is dusted over wounds so as to form a thin layer. If used in large quantities it cakes and produces irritation of the skin, and sometimes superficial ulceration. If for any reason it is used in large quantities, it must be covered with gauze and with paraffin paper to prevent caking. 3. *Acetanilid vaselin*, made by rubbing powdered acetanilid 1 part with "cream-white vaselin" 20 parts. It is very useful as an application to cracked nipples and superficial lesions generally. Using precaution against poisoning, the strength of this ointment may be increased. 4. *Acetanilid gauze*, made by dusting 17.5 parts of boric acetanilid over 82.5 parts of sterilized gauze (making a 2.5% acetanilid gauze) in the form of hemmed strips 10 ft. long and 1 in. broad. These strips are then rolled like ordinary roller bandages, stored in sterilized air-tight jars, and used in place of iodoform-gauze. 5. *Acetanilid oil* has been used in a few cases as an injection in the strength of 1 : 40. Reichel[2] considers the question as to whether it is advisable after the operation of abdominal section to stimulate or depress *peristalsis*, and, further, what influence treatment has upon intestinal paresis or ileus. He believes that, regardless of the fact that the operation may be aseptic, there may be a migration of bacteria, that these bacteria may be distributed over the entire peritoneum, and may possibly be quickly absorbed and destroyed, but that, on the other hand, diffuse or circumscribed purulent peritonitis may result. Also, that if this purulent peritonitis is isolated the prognosis is always better. Granted that this is true, he concludes that in cases of intestinal resection and those sections in which a portion of infected material is allowed to remain in the abdominal cavity, the arrest of peristalsis is not advisable—that the administration of opium does harm. He advises that from the day of operation peristalsis should be slightly stimulated by the administration of small doses of saline water, and the bowels should be

[1] Am. Jour. Gyn., Apr., 1896.

[2] Arch. f. klin. Chir., Bd. 50, H. 2, 1895.

opened on the second or third day. Should the symptoms of subacute intestinal paresis or ileus appear, probably due to intestinal adhesions, no food and only a small amount of water should be given; also that the stomach should be repeatedly washed out and opium given in suppository. Saline cathartics are now contraindicated. If the patient's condition improve, an enema of water containing glycerin should be administered. If, after 24 hours, or at the latest 48 hours, the patient's condition have not improved, the abdomen should be reopened. When the trouble is thought to be due to mechanical occlusion of the intestine, as when there is advanced peritonitis, purgation is strongly contraindicated. Reichel believes that simple mechanic occlusion is rare; that the greater number of cases are due to paresis of the intestinal muscle-wall where the intestine is bent upon itself or looped; that this paresis and the stenosis is increased and the bowel distended when artificial peristalsis is induced. Therefore this condition is best treated by keeping the intestinal tract at rest. The abdomen should be reopened when there is sepsis and when the symptoms point toward mechanic obstruction.

To overcome the *intense thirst* that follows abdominal section Humiston[1] for 3 days prior to operation orders the patient to drink 1 pint of hot water an hour before each meal and on retiring, making 2 quarts of water each 24 hours, the last pint to be taken 3 hours before the time set for operation. No thirst follows the operation, the tongue is moist, and the renal function active. The water supplies the loss occasioned by the free catharsis.

The successful results obtained from the use of thyroid extract in the treatment of diseases dependent upon removal of the function of the thyroid gland has led Mainzer[2] to employ a preparation of the ovaries of cows and calves in the treatment of the phenomena that often appear at the menopause or in the sequence of removal of the ovaries for any purpose. In a given case the attendant symptoms, fulness of the head, palpitation of the heart, vertigo, flushing, and sweating, were relieved by the use of such a preparation, the use of which was at the same time unattended with any unpleasant effect.

Hydrosalpinx.—Hydrosalpinx is a collection of serous fluid in a Fallopian tube, rarely becoming larger than a child's head. T. S. Cullen[3] divides it into four varieties: 1. *Hydrosalpinx simplex.* Here the tube is usually normal in size at the uterine end, but dilated toward the fimbriated extremity, appearing convoluted, and, curving backward and inward, usually falls into the pouch of Douglas. The walls are generally thin and covered by adhesions, and may contain areas of calcification; the muscular coat is normal or atrophic. A calculus may exist in the lumen of the tube. 2. *Hydrops tubæ profluens*, a rare variety, and differing from the foregoing in that the uterine end of the tube is patent at times, Hennig's sphincter probably occluding it in the intervals. 3. *Hydrosalpinx follicularis.* This resembles hydrosalpinx simplex externally, but the mucosa appears honeycombed, and no central lumen may be seen.

[1] Am. Jour. Obst., July, 1895. [2] Deutsch. med. Woch., 1896, No. 12, p. 188.
[3] Johns Hopkins Hosp. Rep., vol. iv., Nos. 7, 8.

4. *Tuboovarian cyst*, a dilated Fallopian tube resembling a simple hydrosalpinx and communicating with an ovarian cyst.

Hydrosalpinx is probably due to infection during childbirth or miscarriage, or to gonorrhea. In hydrops tubæ profluens Hennig's sphincter probably closes temporarily the uterine end of the tube. Hydrosalpinx follicularis is usually preceded by salpingitis, which causes adhesions of the mucosa, and thus forms the alveoli, which become distended by fluid. In tuboovarian cysts the tube becomes adherent to a small ovarian cyst, and their growth causes, by pressure, absorption of the intervening tissue. The normal secretion of a tube can produce hydrosalpinx if both ends be occluded. There are no fixed symptoms, but usually sharp, dull, intermittent or continuous pain in the ovarian region, at times radiating down to the knees, and most severe at the menstrual periods. Defecation and coition may cause pain. The influence on menstruation is doubtful. The disease causes a liability to miscarriage, and sterility is often produced. Diagnosis is aided by feeling through the vagina a cordlike mass running from the uterus and suddenly dilating and giving a sense of elasticity. A positive diagnosis can rarely be made, except in hydrops tubæ profluens. We must differentiate subperitoneal myomata, pyosalpinx, tubal pregnancy, ovarian tumors, and prolapsed and distended sigmoid flexure. The prognosis is good. For treatment the tube and ovary must be shelled out of their adhesions and removed; if they are densely adherent, the uterine cornu is resected to obtain a starting-point.

Tuberculosis of the Fallopian Tubes.—[It is now very conclusively demonstrated that tuberculous inflammation of the Fallopian tubes is much more frequent than has been supposed.] In a second paper on this subject Penrose and Beyea[1] report a series of 27 cases of pelvic inflammatory disease upon which operations were performed, in which 4 cases of tuberculosis of the tubes were found, giving a percentage of 14.8. Orthmann[2] states that primary tubal tuberculosis occurs in 18% of all cases of tuberculosis of the female genital tract, the ovaries and tubes being the portions most frequently involved. He reports 2 cases of primary tuberculosis of the tubes, and further states that secondary infection from the tubes takes place most frequently in the peritoneum, next in the uterus, and then in the ovary. Ascites occurs relatively seldom—in 15% of the cases.

Van der Veer[3] emphasizes the importance of cervical laceration as a point of development of tuberculosis. He also states that tuberculosis of the female genitals is of two varieties—miliary tuberculosis, and chronic, diffuse, fibroid tuberculosis, the caseous form of the disease.

Maas[4] calls attention to the rare occurrence of genital tuberculosis in children in comparison with its frequent appearance in other regions. In a careful search through the literature he was able to find only 7 cases, to which he adds an eighth. In the autopsy upon a girl 5 years old, who died of general tuberculosis, he found tuberculous ulceration of the mucosa of the uterus and

[1] Am. Jour. Med. Sci., Mar., 1896.
[2] Internat. Med. Mag., Jan., 1896.
[3] Ibid., June, 1896.
[4] Arch. f. Gynäk., 1896, Bd. li. H. 2.

tubes. The muscular wall of the latter was filled with tuberculous nodules, but that of the uterus was not affected. The ovaries were normal. There seemed to be no doubt that the internal genitals were the original seat of the trouble. The cause of the infection was most obscure. It seemed improbable that bacilli could enter the vagina, as the hymen was intact and the ordinary causes (coitus, unclean instruments, etc.) could be positively excluded. Moreover, the vagina was healthy. The presence of a line of old fibrous tubercles along adhesions extending inward from the umbilicus to the parietal peritoneum led the writer to infer that the infection entered through the navel—a fact of considerable interest to the obstetrician.

Pneumoperitoneum.—Gas in the abdominal cavity is a matter of considerable interest, and Ross[1] has presented an exhaustive paper upon the subject. He classifies pneumoperitoneum or tympanites as follows: 1. Tympanites intra intestina. 2. Tympanites extra intestina: A. Traumatic: *a*. From without; *b*, from within; B. Nontraumatic or spontaneous: *a*. Without liquid, gas odorless; *b*, ascites, and gas odorless or fetid; *c*, pus and fetid gas. 3. Tympanites intra et extra intestina. The first variety is frequently met with as a consequence of inflammation of the intestines themselves or of their serous coats; from obstruction of the lumen of the bowel from any cause; or as a result of the action of certain poisons, as atropin. The entrance of gas from without the abdomen is rare, but there are several cases on record of the second variety of traumatic tympanites following perforation of round ulcers, of dysenteric ulcers, of typhoid ulcers, of secondary ulcers due to stricture, of ulcer of the cecum, from perforation of the appendix, from malignant sarcomatous ulcers, and from rupture of the intestines from a blow on the abdomen. Ross has found records of 5 cases of spontaneous or nontraumatic tympanites extra intestina in which no fluid was present and in which the gas was odorless. As regards treatment, he believes that in all cases of marked pneumoperitoneum exploratory abdominal incision is justifiable.

DISEASES OF THE OVARIES.

Cystomata.—Cases of more than ordinary interest are reported by Stocker,[2] Peters,[3] Cripps,[4] Croom,[5] Jahreiss,[6] Travers,[7] Doege,[8] Thomson,[9] Seguen,[10] and Cullingworth.[11] The latter successfully removed an ovarian cyst weighing over 80 pounds from a girl 16 years of age. Jahreiss records an acute torsion of an ovarian pedicle in 4 cases relieved by ovariotomy, while Travers has successfully removed an ovarian tumor showing axial rotation and associated with a retroperitoneal cyst of the same side from a woman 51 years of age. Doege's case was one of parovarian cyst complicated by the passage of renal calculi,

[1] Am. Jour. Obst., Nov., 1895.
[2] Centralbl. f. Gynäk., 1895, No. 45.
[3] Ibid., 1895, No. 13.
[4] Lancet, Feb. 15, 1896.
[5] Med. Press and Circ., Dec. 4, 1895.
[6] Münch. med. Woch., Dec. 10, 1895.
[7] Lancet, Nov. 16, 1895.
[8] Med. Rec., Sept. 14, 1895.
[9] St. Petersburg. med. Woch., 1895, No. 26.
[10] Ann. de Gyn. et d'Obst., Feb., 1896.
[11] Lancet, June 1, 1895.

the case simulating and being diagnosed as one of ectopic gestation; a successful operation was performed. Croom records an interesting case of glycosuria complicating a colloid cyst of each ovary, but unassociated with the usual diabetic symptoms. The two tumors weighed 56½ pounds. In 6 weeks' time all traces of sugar were gone. Peters reports a case of ileus due to simple pressure of an ovarian cyst. In the other 12 reported cases the obstruction was due to torsion of the pedicle. The patient, aged 60 years, had had an abdominal tumor for 10 years, with symptoms of intestinal obstruction of a year's standing. Peters was called to see her on account of a sudden attack of abdominal pain. She had had no movement of the bowels for 4 days; two small stools followed the administration of high enemata. On examination the abdomen was found to be tympanitic, a cystic tumor as large as a man's head being detected, which filled the pelvis. There was an umbilical hernia the size of the fist, which contained omentum, but no intestine. The diagnosis of ovarian tumor with torsion of the pedicle was made, but on opening the abdomen the obstruction was found to be due to direct pressure of an adherent papillomatous cyst upon the cecum. The patient had a spontaneous evacuation of the bowels 2 hours after the operation, and made a good recovery. Stocker's case was one of a large right ovarian cyst in which an acute torsion occurred, the pedicle being twisted 4 times. On the second day the patient became restless, then sleepy, and on the following day comatose. Urine was secreted sparsely, and contained much albumin, and later leucin and tyrosin crystals. The conjunctivæ at length became distinctly yellow; the abdomen never felt tense; and on the fourth day the patient died. The autopsy revealed an acute yellow atrophy of the liver, that organ being small, flaccid, and intensely yellow, with minute ecchymoses sparingly spread over its surface. There was no trace of peritonitis, and the pedicle was healthy. Stocker believes that the liver disease began before the ovariotomy, and was due to the torsion of the pedicle, necrosed products being absorbed into the circulation. Cripps reports 13 cases of *strangulated ovarian cysts* encountered in 3 years' time in the women's ward at St. Bartholomew's Hospital, out of a total of a little over 100 ovariotomies during that period. The symptoms of strangulated ovarian cyst are very characteristic, if the twist occurs suddenly. The woman is suddenly seized with severe abdominal pain, sometimes sufficient to make her feel faint, and generally followed by some vomiting; there is a diffuse tenderness over the whole abdomen, and coincidentally with this attack the tumor seems to swell up and become harder. On abdominal examination the tumor may be felt of a globular outline, but generally of not a very large size. It is tender on pressure, and has a somewhat firmer feel than the majority of ovarian cysts. It can be moved from side to side, and occasionally some creaking can be heard and felt, due to the rubbing of inflamed peritoneal surfaces. The general condition is one of distress; the pulse is rapid, and the temperature more often raised than not, though the thermometer is not a reliable guide. If the temperature is elevated, the prognosis is far more favorable than when the same symptoms are present with a normal or subnormal temperature.

Symptoms resembling those of a twisted cyst may be due to a simple inflamed cyst, a ruptured cyst, an extrauterine fetation, or a hematocele. The outline of a twisted cyst is well defined; it feels firm and the tumor is somewhat larger than previously, while in a ruptured cyst the outline of the tumor becomes indistinct, and the cyst feels flaccid, is smaller, or even disappears, while there is dulness in the flanks from gravitation of the extravasated contents to these regions. If a twisted cyst is not diagnosed early, the symptoms may rapidly pass on into those of acute peritonitis. The treatment is immediate operation.

Mangold[1] distinguishes 2 forms of *infection of ovarian cystomata*—namely, saprophytic and septic. The former causes suppuration of the cyst-contents, and is recognized by the hectic character of the fever, slight pain and general disturbance, the absence of evidences of peritonitis, and the presence of gas in the upper portion of the cyst. The prognosis is good. Great care should be exercised to remove the cyst intact or, in the event of rupture, to protect the peritoneal cavity and wound. Septic infection is due to the presence in the cyst-contents of pyogenic cocci, gonococci, and the bacilli of typhoid and tuberculosis, and the colon bacilli. Chills, fever, rapid pulse, peritonitis, and profound general disturbance indicate the serious nature of the process. The prognosis is less favorable than in the former case. Bacteria may enter a cyst by direct implantation through the venous circulation (especially from a septic puerperal uterus), through the lymphatics by extension from an infectious peritonitis, and from the gut when the latter is adherent to the cyst. Puncture, incision and drainage, coitus during menstruation or the puerperium, infectious diseases (typhoid and malaria), gonorrhea, salpingitis, and peritoneal tuberculosis are all etiologic factors. Spontaneous suppuration of dermoids is due to the setting free of a pyogenic irritating substance from the cyst-contents.

Pfannenstiel[2] presents an elaborate paper on *papillary growths of the ovary*. He remarks that while papillary parovarian cysts and hydrops folliculi are quite innocent, ovarian sarcoma and carcinoma of the papillary variety are extremely malignant. Between these extremes stands papillary adenoma, the prognosis of which is favorable, provided that the entire tumor be removed and there are no metastases on the peritoneum. Even when portions of the tumor are left behind, the progress of the case to a fatal termination is slow. On the other hand, a considerable proportion of these papillary cysts are primarily carcinomatous. Malignant degeneration of a true adenopapilloma is by no means so common as has been stated. Bland Sutton[3] has ascertained that simple cysts of the oophoron grow with far greater rapidity than the adenomata and dermoids. He further states that a dermoid may arise in the ovary and attain dangerous proportions in an adult woman within the space of 3 years, and concludes that ovarian dermoids are not due to inclusion of surface epiblast.

As a contribution to the subject of the *hereditary transmission* of ovarian cystomata Löhlein[4] reports the cases of 3 sisters, all of whom presented cysts of both ovaries, which were removed by operation. Olshausen, who has

[1] Centralbl. f. Gynäk., No. 40, 1895. [2] Arch. f. Gynäk., Bd. xlviii. H. 3, 1895.
[3] Clin. Jour., June 19, 1895. [4] Monatsh. f. Geburtsh. u. Gynäk., 1896, B. iii. H. 2, p. 91.

probably enjoyed the largest experience of similar nature, has reported the cases of 3 sets each of 2 sisters, in which he has operated for the removal of ovarian cysts upon one side.

The fluid contained in ovarian cysts has been suggested by McCann[1] as a medium for the cultivation of the gonococcus and other microorganisms. It is necessary for this purpose to obtain specimens of fluids that are fairly clear, but at the same time contamination with blood should not prevent the fluid being used. The trocar used to tap the cyst should be sterilized by boiling. The first portion of the ovarian fluid being rejected, the remainder is collected in tall cylindric glass jars, known to bacteriologists as "blood-jars." These glass jars, which are provided with an accurately fitting glass stopper, are first cleansed with a 1% solution of mercuric chlorid, followed by absolute alcohol. The stopper should be smeared with vaselin containing mercuric chlorid, to prevent it becoming fixed and to exclude atmospheric dust from the jar and its contents. The fluid collected in the jars should be allowed to stand for 24 hours in a cool place, when any sediment will have been deposited at the bottom. It will be well to boil a portion of the fluid in a test-tube in order to determine the proportion of albumin. If the fluid turns solid on boiling, it will prove a good medium. As the proportion of albumin in cystic contents varies considerably, it is specially needful to adopt this precaution. The fluid having been cooled as described, the supernatant portion is removed by means of a sterilized pipet and transferred to sterilized test-tubes provided with sterilized cotton-wool stoppers. The test-tubes are then placed in a slanting position in an incubator, which should be kept at a temperature of from 66° to 68° C. for 4 hours. After this time the fluid is of gelatinous consistence and good transparency. It will be found that the gonococcus grows better when little mounds of pus are placed on the medium instead of streaks or punctures. The inoculated test-tubes should be placed in a glass vessel half filled with distilled water and provided with a well-fitting glass plate. The object of the distilled water is to moisten the air in the vessel, so that the surface of the medium is kept in a similar condition. The glass vessel containing the test-tubes should be placed in an incubator kept at from 30° to 34° C. The cultures thus obtained after 24 to 48 hours are very thin, scarcely visible, grayish-yellow by reflected light, the surface smooth and moist, the edges diffusing into the surrounding medium, which is not liquefied. [The main objection to the use of this substance as a culture-medium is the difficulty of securing a sufficient quantity of the fluid. Aside from this it would appear to be a very desirable and appropriate substance for the purpose.]

Cases of *ovarian dermoid* are reported by Lannelongue and Faguet,[2] Ullmann,[3] Richardson,[4] Forbes and Reid,[5] and Schulze.[6] The latter describes an operation for the removal of 2 retrorectal dermoid cysts extending from a point just above the sphincter ani as high as the pelvic diaphragm. He believes

[1] Lancet, May 30, 1896.
[2] Nouv. Arch. d'Obstét. et de Gyn., No., 8, 1895.
[3] Wien. med. Presse., Sept. 22, 1895.
[4] Boston M. and S. Jour., Apr. 25, 1895.
[5] Intercol. Med. Jour. of Austral., Jan. 20, 1896.
[6] Deutsch. med. Woch., No. 22, 1895.

that these tumors originate not from the ovary, but from the spinal canal or external skin, and advises their removal through an incision in the perineum, the ischiorectal fossa being opened by a cut extending from the posterior third of the right labium majus to a point 1 in. above the anus; the levator ani is separated in the direction of its fibers. Forbes and Reid's case was an enormous dermoid cyst of the left ovary, the removal of which was followed by the development of a spindle-celled sarcoma, with ultimate death of the patient. Lannelongue and Faguet report a case of dermoid cyst of the right ovary associated with an endothelioma, the latter being a rare variety of tumor first described by Eckhardt and Pomorski. The tumor in Ullmann's case weighed 35 lb. and contained 13½ pints of a greasy fluid.

Solid Ovarian Tumors.—Cases are reported by von Kahlden,[1] Hirst,[2] Skene,[3] Page,[4] and Alfred J. Smith.[5] Hirst's case was one of a large myoma of the ovarian ligament, one of the rarest of all pelvic tumors. It weighed 3 lb. and measured 15 in. in the smallest circumference; histologically, it was of the nature of a leiomyoma. Skene reports a case of ovarian cystomata and carcinomata involving both ovaries; a successful operation was performed. Smith's patient suffered from a myosarcoma of the left ovary associated with an enormous quantity of ascites, while Page's patient, a child of 6 years, presented a fibrosarcoma of the left ovary weighing 3¾ lb. This is the youngest patient who has ever successfully undergone an operation of this kind. Von Kahlden describes a peculiar form of carcinoma of the ovary removed from a young girl. The growth did not arise directly from the epithelium of the follicles, but passed through a stage that must be looked upon as adenoma of the Graafian follicles—a condition hitherto unknown.

Cullen[6] records a unique case of adenomyoma of the round ligament occurring in a woman 37 years of age. Histologically, the growth was composed of nonstriped muscular fibers, with glands traversing the nodule in all directions (see Figs. 117, 118). The tumor was of slow growth and evidently benign.

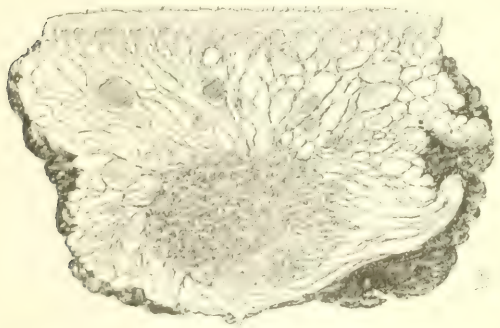


FIG. 117.—Cullen's case of adenomyoma of the round ligament, natural size (Johns Hopkins Hosp. Bull., May-June, 1896).

Hernia of the Ovaries.—Cases have been noted by Cousins[7] and Lockwood.[8] Lockwood's patient was an infant, in whom the ovary was found in the right inguinal region with torsion of its pedicle. Cousins reports a case of acquired inguinal ovarian hernia on the right side, and also an exceedingly rare case of rup-

[1] Centralbl. f. Allg. Path. u. Pathol. Anat., Apr., 1895.
[2] Am. Jour. of Obst., July, 1895.
[3] Brooklyn Med. Jour., Aug., 1895.
[4] Lancet, Dec. 28, 1895.
[5] Dublin Jour. of Med. Sci., Jan., 1896.
[6] Johns Hopkins Hosp. Bull., May, June, 1896.
[7] Brit. Med. Jour., July 27, 1895.
[8] Ibid., Sept. 21, 1895.

ture of Douglas's pouch, with protrusion of the uterine appendages through the vulvar orifice, in a melancholic woman 50 years of age (see Fig. 119).



FIG. 118.—A portion of the adenomyoma enlarged 16 times (Johns Hopkins Hosp. Bull., May-June, 1896).

Prolapse of the Ovaries.—Sänger[1] differentiates 2 classes of descent of the ovaries. In *descensus lateralis* the ovary remains at the side of the uterus, while in *descensus posticus* or retrouterine it is found behind the uterus and over the fornix. As etiologic factors for this descent, injuries, the puer-

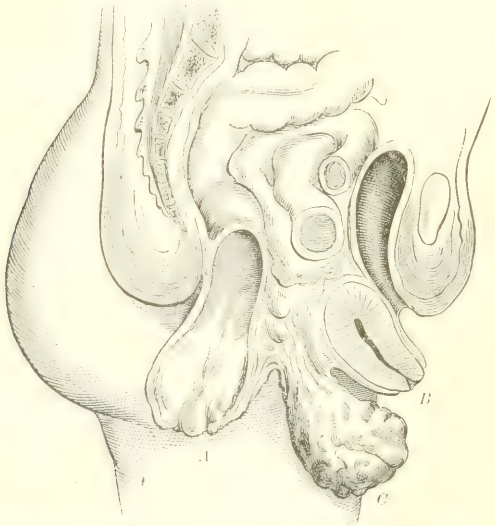


FIG. 119.—Diagram showing the protrusion of the appendages externally: *A*, rectal prolapse; *B*, uterus; *C*, uterine appendages (Brit. Med. Jour., July 27, 1895).

perium, malposition of the uterus, the removal of tumors, and enlargement and abnormal mobility of the ovaries are mentioned; to these must also be added the result of vaginal celiotomy. The treatment may be either medical or operative. To the operative methods Sänger adds the artificial fixation of

[1] Centralbl. f. Gynäk., No. 9, 1896.

the movable ovary, the ovary being attached to the side of the pelvis; this operation is termed "pelvifixura ovariosum." He reports 2 successful cases.

Abscess.—Langer[1] reports 5 cases of isolated abscess of the corpus luteum operated upon at the Prague Clinic within a month. Microscopic examination proved these to have arisen from suppuration of preexisting corpora lutea, as shown by the presence of the characteristic cells. These abscesses are to be distinguished from those that develop from a Graafian follicle or corpus luteum cyst. Etheridge[2] reports 3 cases of ovarian abscesses produced by the *micrococcus lanceolatus* (*diplococcus pneumonia*); hitherto there have been no such cases reported. The pus was loaded with the micrococci.

Anomalies.—According to Otto Engström[3] of Helsingfors, there are two distinct kinds of supernumerary ovaries. One is due to anomaly of development, in which three ovaries are formed instead of two. These cases are rare, and their existence was doubted by Rokitansky, Klob, and others. Winckel[4] reported the first case of the kind in 1881, in which ovaries on either side were normal, but on the right side and in front of the uterus was a supernumerary ovary larger than either of the others, and attached to the uterus by a ligament originating from the right round ligament. The ovary was situated in a fold of peritoneum connected with the bladder. Other cases have since been observed by different writers. Besides cases of this kind, there are supernumerary ovaries due to division of a normal ovary by inflammatory processes and the formation of bands. Engström presents photographs of a case of this kind. The patient was 55 years old and was operated upon for a myoma. She had suffered many times from peritonitis. On the right side was found an ovary nearly divided into two parts by the presence of bands. The part near the uterus appeared nearly normal, while the distal half was badly degenerated and contained blood-clots. The band of tissue connecting the parts together contained ovarian tissue. [We must therefore make a classification of supernumerary ovaries into congenital and acquired.]

The Ovaries in Osteomalacia.—Rossner[5] made careful examinations of the ovaries in 3 cases in which castration was performed for the cure of osteomalacia. In the cortical substance the microscope revealed hypertrophy of the vessel-walls with extensive hyaline degeneration. Curatulo and Tarulli[6] conclude that the ovaries, like other glands, have a secretion peculiar to themselves which is separated from the blood, but the chemical composition of which is not known. It possesses the property of oxidizing phosphorus-compounds or those that furnish the lime-salts of the bones; hence, after the removal of the ovaries in osteomalacia there is an increased deposit of calcium and magnesium phosphates in the bones, thus restoring the normal firmness of the latter.

[1] Arch. f. Gynäk., Bd., xlix. H. 1, 1896.
[2] Am. Jour. Med. Sci., Apr., 1896.
[3] Monatsh. f. Geburtsh. u. Gynäk., iii. No. 1, p. 13, 1896.
[4] Lehrbuch, 1890, p. 617.
[5] Arch. f. Gynäk., Bd. xlviii. H. 3, 1895.
[6] Centralbl. f. Gynäk., No. 21, 1895.

PATHOLOGY.

By JOHN GUITÉRAS, M. D., and DAVID RIESMAN, M. D.,
of Philadelphia.

Resume of the Year's Progress.—All branches of pathology show evidences of progress, and, while the year has not cleared up many obscure problems, much has been accomplished to give us a better comprehension of the nature of a number of morbid processes. In the subject of hematology we would point out the researches on leukemia, which, though far from elucidating the causes of that disease, have brought to light several important facts. The nature and origin of eosinophile cells remain, however, still obscure. Pernicious anemia is probably firmly established as a hemolytic disease, with the probability that the hemolytic agent is derived from the gastrointestinal tract. Under the head of diseases of the circulatory organs the researches of Banti on the causes of loss of compensation in valvular heart-disease are given at some length, and will be found instructive. Among diseases of the nervous system the subjects of multiple sclerosis and of spastic paraplegia have been much advanced. There is increasing evidence that the latter disease has nearly always a multiple sclerosis as its anatomic basis. The question of the occurrence of hematogenous jaundice has received considerable attention, and the experiments of Auld and of Hunter will be found detailed in the section on diseases of the digestive tract. Under diseases of the respiratory tract a description of Abel's ozena-bacillus has been given, and reference is made to a number of studies on the etiology of pleurisy. Valuable papers on pneumonia are also noted. In the science of onkology the greatest interest still is centered in the causation of the malignant tumors, but we cannot say that, despite a large number of valuable researches, we feel impelled to change the opinion expressed last year on this question. It is clear, however, that the protozoan theory has fallen into desuetude. Efforts are being made, principally by the Italian school under the leadership of Sanfelice, and by a few German pathologists, to prove that blastomycetes are the cause of malignant neoplasms, but the evidence so far does not warrant a positive conclusion. Great advances have been made in bacteriology, particularly in the line of immunity. The peculiar reactions discovered by Pfeiffer between the serum of immune animals and the bacteria to which they are immune, and studied by him, Kolle, Löffler and Abel, Gruber and Dunbar, and others, are of extreme importance, and already clinicians are endeavoring to utilize these reactions for purposes of clinical diagnosis. In the subject of tuberculosis the studies of Kossel on

tuberculosis in early childhood are interesting. The specificity of the typhoid bacillus may be considered settled by the results of Pfeiffer's experiments. Elsner's method of isolating the bacillus promises to be of great value, enabling us to make an early diagnosis. The researches of Vaillard on the heredity of acquired immunity confirm the theories of Ehrlich on this subject. Progress is being made in the effort to isolate, in a solid form, the antitoxic bodies of the serum of immune animals. Antistreptococcic serum gives promise of usefulness. Diphtheria-antitoxin and diphtheria-immunity are still subjects of diligent research. In the section on technic the more important advances will be found noted. The concluding pages of the chapter on Pathology comprise references to a variety of interesting subjects not elsewhere classifiable.

To any one who follows pathologic and clinico-pathologic literature it must be evident that a revolution is silently but surely being accomplished in medical science—namely, the subordination of morphologic to chemic studies. The science of chemic pathology is increasing in strength and importance, and we hope in future pages to give due prominence to its results.

DISEASES OF THE BLOOD AND THE BLOOD-MAKING ORGANS.

Hematologic Studies.—Weiss[1] publishes the results of work extending over a number of years. The first chapter of his monograph deals with the **vanillin-reaction of the eosinophile cells.** Since the α-granules give the vanillin-reaction, they must be considered as albuminous. In another chapter Weiss points out that of all the elements of the blood the eosinophile granules are the most resistant; they even defy the action of the gastric juice. With respect to the characteristic blood-change in leukemia, the author states that it consists in a polymorphism of the white cells, in a multiplicity of sizes and forms of the cell-bodies and nuclei, and in the presence, as far as size is concerned, of all possible gradations of granule-cells. It is this polymorphism that distinguishes the blood-picture of leukemia from that of leukocytosis. In another section the blood-picture of a **lymphosarcoma of the spleen** is described. The diagnosis had wavered between tumor of the spleen and tumor of the kidney. The blood showed leukocytosis characterized by an increase of eosinophile cells and an absence of polymorphism. This led the author to diagnosticate a nonleukemic splenic tumor, and, as already indicated, the tumor was a lymphosarcoma. The bone-marrow showed the changes seen usually only in leukemia. In the author's opinion, the sarcoma directly sends cells into the blood and contributes to the leukocytosis. In the next chapter the characters of the blood of infants, both in health and suffering from various diseases, are described. With regard to **anæmia infantum pseudoleukæmica,** the author is cautious in forming a final judgment as to its independent character; he recognizes a distinct hematologic picture to which this name is applicable, but is not prepared to admit that it is a separate disease with definite clinical symptoms. With von Limbeck he believes that between

[1] Hämatologische Untersuchungen, Vienna, 1896.

anæmia infantum pseudoleukæmica and leukemia there is an intimate relation, if, indeed, the first is not a special form of the latter disease.

In the chapter entitled "**The Correlation of the Blood and Organs,**" the author takes the ground that all tissues can form leukocytes, and that these enter the blood through the lymph-paths. Neusser has already accorded to the skin a hematopoetic function; the author ascribes the same property to the bronchial and intestinal mucous membranes, and, indeed, to all tissues. The blood thus becomes the *direct representative of all the bodily organs.* The next two chapters deal with **pseudoleukemia.** Weiss excludes pseudoleukæmia lienalis and medullaris as nonexistent, and maintains that there is only a lymphatic pseudoleukemia. As lymphemia the author describes a condition in which the leukocytosis is due to a great increase in lymphocytes. Three cases are described, of which 1 was, anatomically, a myelo-lieno-lymphatic leukemia, 1 chiefly intestinal, and 1 medullary, yet all presented the same blood-changes. The relation of lymphemia to leukemia is referred to in the conclusions, which are as follows: 1. The terms lienic, myelogenic, and lymphatic leukemia should be avoided. They are applicable only to the disease of the spleen, bone-marrow, and lymph-glands as observed at the autopsy. Clinically, they are of no value, for, 2. It is not possible to infer disease of any special organ in leukemia from the blood-state. 3. There are only two forms of leukemia: (*a*) *Lymphemia:* The blood shows an increase of white cells of the type of lymphocytes; (*b*) *Leukemia proper:* The blood presents an increase of white cells, of the type of leukocytes in the wider sense—cells presenting all possible variations between the size of the nucleus and the size of the cell-body. 4. The increase of the eosinophile cells occurs generally only in leukemia proper, exceptionally in lymphemia. 5. The characteristic feature of the leukemic blood as against that in leukocytosis is the polymorphism of the white cells. This affects either the lymphocytes or the leukocytes in a wider sense. 6. Two types of leukemia may therefore be recognized from the clinical standpoint—(*a*) Leukemia of lymphocythemic type; (*b*) Leukemia of leukocythemic type. 7. It is impossible from a microscopic study of the organs to draw any inferences concerning the differences between the two diseases. 8. The conception of "acute leukemia" should, if possible, be narrowed. The leukemias of lymphocythemic origin are not always acute, but may run a chronic course.

The Myelocyte of Ehrlich.—Cabot[1] has made a study of the distinguishing characters of the myelocytes. The criteria formerly employed—size, shape, and number and shape of nuclei—are not of much value. 1. The staining characters of the myelocyte-nucleus (pale and even) are generally to be contrasted with those of the cell most resembling it (the so-called "multinuclear" cell), the nucleus of which stains darkly and unevenly. But this criterion will not always serve. 2. The shape of the myelocyte-nucleus (round or oval) is generally to be contrasted with that of the multinuclear cell (twisted, broken), and when this differentiating mark is not present there is, usually, 3. The comparative juxtaposition of the nucleus of the myelocytes to

[1] Boston M. and S. Jour., Jan. 2, 1896.

the surface of the cell as a guide in distinguishing them from the "multinuclear" cells, the nucleus of which is more centrally placed, or, if it approaches the surface, quickly leaves it again. But even with these criteria it becomes at times difficult to say whether certain cells are myelocytes or multinuclear cells. The author then suggests the following definition: "A myelocyte is a spheric, neutrophilic cell, varying in diameter from 7 μ to 20 μ or more, and characterized by the presence of one (or rarely two) nuclei which [with Biondi's stain] stain faintly and evenly, with a purplish or greenish-blue color, are generally round or oval, often vacuolated, and are in close relation to the surface of the cell for a comparatively large portion of their extent." He concludes as follows: 1. The definition of myelocyte must be enlarged so as to include cells of all sizes from 7.5 μ upward. 2. The percentage of myelocytes in leukemia is much larger than that generally given in text-books; 25% is a small number. 3. Small percentages of myelocytes are the rule in pernicious anemia, common in malignant diseases of cachectic type, and not uncommon in a variety of other conditions.

Eosinophile Cells.—Vorbach[1] examined 20 cases of gonorrhea, and comes to the following conclusions: There is no corresponding relation between the number of eosinophile cells in the blood and **in the gonorrheal discharge.** The appearance of eosinophile cells in the discharge depends entirely on the condition of the urethral mucous membrane. The eosinophile cells in the gonorrheal discharge have no diagnostic significance. Examination of the blood in 18 healthy individuals gave a proportion of eosinophile cells to other leukocytes of 0.5–11.5%, the mean being 4.22%. Grouven[2] found that **the respiratory mucous membrane** in bronchitis, corresponding to the sputum, contained eosinophile cells, although in limited numbers. In tuberculosis eosinophile cells were not found in the mucosa, as also not in the sputum. The normal mucous membrane of the respiratory tract shows absolutely no eosinophile cells, while the intestinal mucosa does. It was not possible to extend the investigations to asthma and croupous pneumonia, as no cases came to autopsy at the time. Stutz[3] found few or no eosinophile cells in the normal mucous membrane **of the stomach;** in all states of irritation or inflammation the cells are increased in number, but only moderately. They are very abundant in carcinoma. In the intestinal mucosa eosinophile cells are, as a rule, present in large numbers. In diseased states the number is variable—in specific suppurative processes they are sparse, especially in tuberculosis, typhoid, and diphtheric ulceration. The appearance of eosinophile cells is probably connected with a certain activity of the mucosa, as, *e. g.*, during digestion. A chemic or slight pathologic irritant produces the

[1] Eosinophile Zellen bei Gonorrhoe, Würzburg, 1895, Inaug. Dissert.; ref. in Centralbl. f. Allg. Path. u. Pathol. Anat., July 15, 1896.

[2] Ueber die eosinophilen Leukocyten der Schleimhaut des Respirationstractus, Bonn, 1895, Inaug. Dissert.; ref. in Centralbl. f. Allg. Path. u. Pathol. Anat., July 15, 1896.

[3] Ueber eosinophile Zellen in der Schleimhaut des Darmkanals, Bonn, 1895, Inaug. Dissert.; ref. in Centralbl. f. Allg. Path. u. Pathol. Anat., July 15, 1896.

same effect, the number of eosinophile cells decreasing with the intensity of the irritant. The author believes these cells are formed in the mucous membrane, although no positive proof is brought forward. He thinks that the ordinary leukocytes in the mucosa of the intestine become eosinophile cells, and that these pass in part externally, in part into the blood.

Local "Eosinophilia" in Carcinoma; the Nature of Eosinophile Cells.—Przewoski[1] observed a marked accumulation of eosinophile cells in 4 cases of carcinoma of the cervix uteri. In discussing this phenomenon the author enters into a consideration of the nature of eosinophile cells. He holds that the eosinophile granules are albuminoid in nature and contain iron. The granules are the secretory product of the protoplasm of certain leukocytes. The cells originate in the blood-forming organs, particularly the bone-marrow, and their function, the author believes, is to act as auxiliary organs in the production of hemoglobin. They unite synthetically the lower compounds of albumin and iron, which are then stored up in the granules. This product later passes in some way into the blood-plasma, and thence is utilized by the erythrocytes for the formation of hemoglobin, analogously to the hematogen of the yolk in the embryo. From this standpoint the eosinophile cells may be considered as glands of mesoblastic origin, the function of which is to prepare material for the formation of hemoglobin by the erythrocytes. The question why the eosinophile cells appear in carcinoma of the vaginal portion of the uterus, and not in cancer of other organs, and why they accumulate in certain inflammatory processes, can scarcely be answered. We can only assume special conditions of eosinophile emigration—a special eosinophile chemotaxis.

A hitherto Unnoticed formed Constituent of the Blood.—Müller[2] describes minute (1 μ), spheric, colorless granules which he has observed in the blood in health and disease. They are soluble (probably) in ether, insoluble in acetic acid, and are not stained by osmic acid. They have nothing to do with fibrin-formation, and undoubtedly exist preformed in the blood; their nature is unknown. Müller proposes the term **hemokonia** (blood-motes) for these particles.

The Blood-changes in Gastric Disorders.—Blindermann[3] has studied the blood of 18 patients in Wassiljeff's clinic. Eight of these had chronic gastritis, 2 acute gastritis, 4 gastric ulcer, and 4 carcinoma of the digestive tract. In acute gastritis the blood was normal; in chronic gastritis the red corpuscles were normal in number or slightly diminished, the white corpuscles unaffected. In gastric ulcer there was oligocythemia, except in 1 case, in which hematemesis was absent; in the others the diminution was exactly proportional to the amount of hematemesis, chlorosis, and melena. In the cases of malignant disease (3 affecting the stomach and 1 the rectum) there was great oligocythemia, with (except in 1 case) leukocytosis. The percentage

[1] Centralbl. f. Allg. Path. u. Pathol. Anat., Mar. 15, 1896.
[2] Ibid., July 1, 1896.
[3] Wien. med. Blätter, Oct. 31, 1895.

of hemoglobin was much more reduced than in gastric ulcer. The author concludes that—1. Examination of the blood affords a means of distinguishing cancer of the stomach from other gastric affections, particularly chronic catarrh and dilatation. 2. With rare exceptions the differential diagnosis between cancer and ulcer of the stomach is simplified by an examination of the blood. 3. In malignant disease of the stomach there is a progressive diminution of the hemoglobin, while in ulcer there is a sudden great decrease after hematemesis, followed in a few days by a return to normal. The only exception to this is in those rare cases in which pernicious anemia supervenes. 4. Chronic gastritis with dilatation causes no definite changes in the blood.

Billings[1] states that there is in **diphtheria**—(1) oligocythemia; (2) leukocytosis (increase in multinuclear cells). This was missed in only two cases—a very mild one and a very severe one. The oligocythemia is less marked in cases treated with antitoxin.

Blood-changes in Anemia.—Sophie v. Moraczewska[2] from a study of 34 cases of anemia concludes that—1. In pernicious anemia there is a marked diminution of alkalinity, a high specific gravity of the blood, a small count of red corpuscles, and these contain an excess of coloring-matter. The blood is rich in nitrogen. 2. Chlorosis is marked by slight alkalinity, high specific gravity, and a considerable number of corpuscles containing little coloring-matter. 3. Carcinoma is characterized by high alkalinity, low specific gravity, a relatively large number of corpuscles which are pale in color. The blood on drying leaves a small amount of residue.

Hypoleukocytosis in Acute Tuberculosis.—Warthin[3] has studied the blood of 2 cases of acute general miliary tuberculosis, and found that the blood does not give us any aid in the diagnosis between typhoid fever and acute tuberculosis. In both cases there was pronounced hypoleukocytosis.

The Blood after Venesection.—Koeppe[4] found that after venesection in rabbits the first nucleated red corpuscles appeared in the blood in from 20 to 48 hours. The blood-corpuscles increased more rapidly than the hemoglobin, which the author explains as follows: The number of corpuscles is augmented, firstly, by the formation of nucleated corpuscles; and secondly, by the constricting off of microcytes (schistocytes) from ordinary red corpuscles which do not increase the hemoglobin, although they do augment the number of erythrocytes.

Leukocytosis of Diphtheria under Serum-therapy.—Ewing[5] from a careful study of a large series of cases of diphtheria comes to the following conclusions: Diphtheria is usually attended by pronounced leukocytosis. The increase of leukocytes begins a few hours after the infection, probably appearing earlier in refractory individuals. In favorable cases the leukocytosis is greatest at the climax of the disease, and steadily declines during convalescence. There may, however, be prolonged hyperleukocytosis

[1] Med. Rec., Apr. 25, 1896.
[2] Virchow's Archiv, Apr., 1896, Bd. cxliv. p. 127.
[3] Med. News, Jan. 25, 1896.
[4] Münch. med. Woch., Sept. 25, 1895.
[5] N. Y. Med. Jour., Aug. 17, 1895.

after other symptoms have subsided. In unfavorable cases the leukocytosis continues until death, but in somewhat prolonged cases, with much septic absorption, there may be an uninterrupted decrease of leukocytes, continuing up to the fatal termination. A complicating pneumonia usually causes considerable increase in leukocytosis. The degree of leukocytosis in diphtheria often varies with the fever, but much more frequently corresponds to the extent of the local lesion. The intravascular leukocytosis of diphtheria measures exactly the systemic reaction against the toxic products circulating in the blood and absorbed from the site of infection. High leukocytosis in diphtheria indicates a pronounced reaction against a severe infection, but is not necessarily an unfavorable prognostic sign. Steadily decreasing leukocytosis usually, but not always, accompanies a favorable course of the disease. Slight leukocytosis generally indicates a mild infection, but fatal cases may for several days show no increase, or even a decrease, of leukocytes. The staining reaction of the leukocytes is an accurate measure of the severity of a diphtheric infection, and variations in this reaction often precede changes in other symptoms. Antitoxin within 30 minutes after its injection causes a hypoleukocytosis, the reduction affecting especially the uninuclear leukocytes, while the proportion of well-stained multinuclear cells is increased. This action is due largely to the immunizing principle contained in the serum. In favorable cases, after the injection of antitoxin, the leukocytosis never again reaches its original height. In severe and less favorable cases the injection is followed in a few hours by hyperleukocytosis and fever, exceeding those symptoms as found in the original condition. In unfavorable cases an injection of antitoxin may be followed immediately by rapid hyperleukocytosis or extreme hypoleukocytosis and death. The reduction of leukocytes immediately succeeding the injection of antitoxin, especially in severe cases of diphtheria, is an undesirable feature. The multinuclear leukocytes found in the blood of favorable cases after treatment by antitoxin show increased affinity for gentian violet. The failure of this change to occur is a very unfavorable prognostic sign. The variations in the staining reaction of leukocytes in diphtheria indicate that the nuclei of these cells contain a principle essential to phagocytosis and immunity in this disease. In normal rabbits the antitoxin produced also an immediate hypoleukocytosis which varied with the strength of the serum.

Busch and Kerr,[1] working under Williams of Buffalo, determined the **relation of the specific gravity to the hemoglobin-percentage of the blood,** basing their studies on Hammerschlag's table. The method employed for estimating the specific gravity was that devised by Hammerschlag. The necessary apparatus consists of an hydrometer-jar, an hydrometer, a pipet of small caliber, a glass rod, some fine steel pens, a bottle of chloroform, one of benzol, and a mixture of the two. The mixture of chloroform and benzol is poured into the hydrometer-jar. The finger, after being washed with bichlorid and alcohol, is punctured. A good-sized drop of blood is introduced into the chloroform-benzol mixture. If the drop sinks, the mixture

[1] Med. News, Dec. 21, 1895.

must be made heavier by adding chloroform. If it rises, the mixture is too heavy and must be made lighter by adding benzol.

The authors' conclusions are as follows: 1. The percentage of hemoglobin in the blood in most cases may be predicted from the specific gravity with sufficient accuracy to be valuable for clinical purposes. 2. Fleischl's hemometer is liable to an error of 10%. 3. Gowers' instrument is liable to an error even greater than that of Fleischl's. 4. The error in technic with the specific-gravity method is likely to be very slight. 5. In following up a case with Fleischl's or Gowers' instrument very erroneous conclusions may be drawn. Mistakes may be made of 5% or 10% too low one day, and 5% or 10% too high on another. 6. In following up a case the specific-gravity estimation seems to give very slight error, and even if from it the absolute percentage of hemoglobin could not be determined, yet the relative increase or decrease of hemoglobin from one day to another might be quite accurately estimated. 7. Because of its being based on the instrument of Fleischl, Hammerschlag's table is of necessity only approximately accurate.

Pathology of Pernicious Anemia.—Hunter,[1] as is well known, holds that pernicious anemia is of hemolytic origin, and that it is a disease *sui generis*. His reasons for the latter view are—1. The extreme degree of blood-change which it invariably presents is always marked by certain pathologic changes, characteristic either as regards their nature or degree or their peculiar association. These changes are constantly met with in the liver, and not infrequently in the kidneys and spleen. 2. These changes are characteristically absent in traumatic anemia or in wasting anemia. 3. They consist for the most part of deposits of blood-pigment, with corresponding increased richness in iron in the liver, preferably in the liver-cells of the outer two-thirds of the hepatic lobule, frequently also in the capillaries of the liver and within the cells of the convoluted tubules of the kidneys. 4. This pigment is not the result of extravasation. 5. From its character and its amount it denotes an excessive destruction of blood as the prominent and most constant and characteristic feature of the disease. While the hemolysis undoubtedly takes place in the area of the portal circulation (especially in the spleen), it cannot be considered as an exaggeration of the ordinary blood-destruction of health. The existence of extravasations in a frequency sufficient to give rise to pernicious anemia (Stockman's view) has not been demonstrated. Furthermore, as the author has shown by experiments (injecting large amounts of blood into the peritoneal cavity of rabbits), the characteristic pigment-changes in liver, kidney, and spleen in pernicious anemia, and the no less characteristic distribution of the pigment among these organs, cannot be produced by absorption of extravasated blood, however large in quantity. The peculiar distribution of the pigment indicates that there is a special cause, and inasmuch as it occurs in the portal area, the poison probably reaches the blood from the gastrointestinal canal. The nature of this poison is not known; Hunter, however, believes that "it is the presence, under certain favorable conditions, of

[1] Brit. Med. Jour., Feb. 8, 1896.

organisms of specific nature within the gastrointestinal tract." [Hunter's views as to the nature of pernicious anemia are undoubtedly gaining ground, and few will now maintain that it is not dependent on a hemolytic process.]

Studies in the Genesis of Red Corpuscles.—Guitéras[1] records observations on the bone-marrow and spleen in leukemia, which have an important bearing on the subject of cytogenesis. The following points were observed in the bone-marrow: The lymphoid reticulum was thickened and the spaces crowded with a variety of cells. No evidence of the formation of red blood-cells was found. There were numbers of cells that presented the nuclear features said to be characteristic of erythroblasts, but it appeared that they became overgrown with protoplasm or presented evidences of nuclear cell-division without being able to form red blood-globules. The protoplasm of such cells frequently showed unmistakable evidence of the presence of hemoglobin. In the wide channels of the lymphoid marrow cells in all stages of direct nuclear fragmentation and varying forms of chromatolysis were found, as well as cells varying in size from small round erythroblasts to very large cells. With the exception, perhaps, of the true erythroblasts, these cells might be considered as interchangeable, and even the erythroblasts appeared to be subject to such changes as might bring about their conversion into the form of cell described as leukoblast; that is, their nucleus might become gradually poorer in chromatin, and might by degrees assume the loose reticulated appearance characteristic of the larger cells.

One of the cells deserves special attention. Its two nuclei were surrounded by a transparent, homogeneous zone and stained intensely red with safranin. As is shown later, bodies similar to these nuclei are especially concerned in the formation of red blood-cells. Similar cells were found containing even a larger number of nuclei, which might be separated or might be joined together by filamentary prolongations. The protoplasm around them contained hemoglobin. These cells undoubtedly represent ineffectual attempts at the formation of red blood-cells. The successful formation of erythrocytes seems to take place only from free nuclei similar to those found within this mass of protoplasm; furthermore, the successful formation of red blood-cells takes place only in contact with endothelial cells, and in the present case only in the spleen. A marked difference between the cell at present described and the one containing pale nuclei could be noted. The nuclear filaments that might be found joining the fragments of the nucleus in the latter cells were pale and usually thick, whilst the filaments of the multinuclear erythroblasts were stained intensely red and were very fine.

The spleen presented an increase of the connective-tissue reticulum. As in the marrow, a number of parallel channels were found, some lined with endothelium, others not. The point to which the author particularly calls attention is the behavior of the erythroblasts in the immediate neighborhood of the endothelial channels. It is here that for the first time anything like the formation of red blood-globules was seen. The process was about as follows: The small free ery-

[1] Internat. Med. Mag., Dec., 1895.

throblast sent a prolongation of varying length through the endothelial wall from without toward the interior of the vessel. This prolongation just within the endothelial lining swelled into a bud that might be smaller or larger than the erythroblast from which it sprang. This small bud presented the same peculiarities as the erythroblast outside. It was around this bud that the formation of the red blood-cells was seen. These seemed to grow around the bud as a protoplasmic formation around the nucleus, except at the point of contact with the filament. If the bud presented a round shape, the hemoglobin-holding protoplasm was also globular. If the bud was pear-shaped, the protoplasm generally presented the same outline. Occasionally the protoplasm grew more from one side of the nucleus. The union between the erythroblast and the bud might be very close, presenting the appearance of a large diplococcus divided by a line of endothelial membrane. In other cases the filamentary union might be as long as 9 μ. In some cases the bud had evidently been broken off or had not formed, and the end of the filament could be seen pointing in the endothelial wall. When the bud-cells with their hemoglobin envelope are disengaged from the endothelial wall, they constitute nucleated red blood-cells. As some of these nuclear buds were found of very small size, with a large blood-cell around them, it is very probable that the latter may be loosened from its anchorage without any nuclear contents, thus constituting a fully-developed red blood-cell. There was also evidence that the bud may be loosened from its moorings without any hemoglobin-formation about it. In that case it constitutes, the author believes, a true blood-plaque. The erythroblasts engaged in the process of filamentary budding are homogeneous, except that occasionally the bud breaks up into small rays extending a short distance into the red blood-cell. Erythroblasts that are not engaged in the process of filamentary budding are frequently of a larger size. In these a densely packed coil of chromatin may be seen, and sometimes a rearrangement of the mitome in obscure karyokinetic figures. The author is of opinion that in such cells the nuclear matrix may swell before the nucleus divides, and the cell is thus converted into the so-called leukoblast. Though the splenic channels, endothelial or nonendothelial, were frequently crowded with red blood-cells of varying shape, very little evidence of pigmentary degeneration was found. The irregular distribution of these red blood-cells made it difficult to decide upon the nature of the endothelial channels—that is, as to whether they were or were not true capillary continuations of the blood-vessels of the spleen. The author holds they are. For purposes of comparison the spleens of a case of cardiac anemia and of progressive pernicious anemia have been examined. In neither of these have the filamentary figures been found. However, in the case of pernicious anemia the tissues were not fixed in osmic acid, and in the case of cardiac anemia, though the attempt was made to fix the tissues by means of osmic acid, the result was not quite successful, evidently on account of post-mortem changes. In the spleen of cardiac anemia the number of red blood-cells in the spleen-channels was very great. The endothelial cells showed no evidences of division. They were, however, more numerous and more globular

than in the case of leukemia, and projected farther into the endothelial channel. Sometimes they were very close together, leaving scarcely any space between them. The closer together they lay the more prominent and globular they appeared. In the case of pernicious anemia the endothelial nuclei were still more swollen and numerous than in the case of cardiac anemia. The capillary spaces are evidently dilated. In both the spleen and marrow distinct evidences of pigmentary degeneration of the red blood-cells were found.

As to the origin of the erythroblasts, the author holds that all the cells described may develop one from the other through a species of metaplasia, the starting-point of which is probably the lymphocyte. The erythroblast appears to originate in the shape of spheric fragments of chromatin that are thrown off from the nuclei of other cells, and the latter may again develop from the erythroblasts by a process of chromatolysis and swelling of the nuclear matrix. The author, however, admits that the opposite view which gives the erythroblasts a specific character and traces their origin to embryonal red blood-cells is also well supported. He has observed the process of filamentary budding of erythroblasts in the spleen of the rat and the rabbit after hemorrhage. He also noted peculiar bodies resembling sporoblasts in the marrow of the case of leukemia examined. The group consisted of 9 cyst-like bodies, vesicular in structure and having a rod-shaped body near the periphery of the vesicle. Concerning the nature of these bodies, whether they are vesicular degenerations of the nucleus, or red cells the walls of which have undergone some change, or whether they are something else, the author is unable to give a final opinion.

Delbet[1] has discovered a bacillus which he considers the cause of lymphadenoma. He gave a dog 14 injections. The first 3 produced small, rapidly healing abscesses. The animal wasted despite a large appetite, and developed cachexia. Delbet thought that the spleen and the visceral ganglia were enlarged, but could not determine positively. The interesting point was the existence of leukemia, the relation of white to red being as 1 to 60 or 70.

The Influence of Acute Infectious Diseases on Leukemia.—Thorsch[2] discusses this question on the basis of a personal observation. Since Eisenlohr first called attention to the recession of the lymphatic glands and spleen and retrograde changes in the blood of leukemia during the course of typhoid fever, a number of instances have been recorded by others (Heuck, Mincke, Stintzing, Müller, Kovács, and Fränkel). Only 1 case (Müller's) is on record in which an increase occurred, but even in this the increase took place in the multinuclear forms. The author's case was a carpenter aged 42, who had enlargement of liver and spleen, submaxillary, supraclavicular, axillary, and inguinal lymphatic glands. The blood showed on entrance hemoglobin 70%, red corpuscles 5,500,000, white corpuscles 80,000. The patient gradually grew worse; the hemoglobin fell to 30%, the red corpuscles to 4,500,000, the white increasing to 140,000. About 98% were uninuclear leukocytes (chiefly lymphocytes), 2% multinuclear; eosinophiles and nucleated red corpuscles were not found. On Oct. 9th the patient was seized with a chill,

[1] Bull. et Mém. Soc. Chir., 1895, xxi.

[2] Wien. klin. Woch., May 14, 1896.

and afterward developed a migrating lobar pneumonia. During the height of the disease the lymphatic glands, liver, and spleen became greatly reduced in size, and the number of leukocytes sank by Oct. 13th to 43,000 (uninuclear 88.7, multinuclear 11.3). As the pneumonic infiltration extended the leucocytosis increased, and on the day of death reached 172,000. Various theories have been advanced to explain the influence which infections exercise on leukemia, but all are unsatisfactory. The author has no explanation to offer, but calls attention to the analogy between the observations in leukemia and the influence of erysipelas on malignant neoplasms, which seem to give support to the view of Barde and Gilbert, that leukemia is related to the true malignant tumors.

Henry[1] reports a case of **parasitic chyluria** with filaria nocturna in the blood. The patient was a woman, aged 29 years, a native of South Carolina. She had been in Philadelphia about a year. The chyluria came on after a normal labor.

DISEASES OF THE CIRCULATORY SYSTEM.

Tuberculosis of the Heart.—Leyden[2] states that there are three forms of cardiac tuberculosis—those affecting (*a*) the heart-muscle, (*b*) the endocardium, and (*c*) clots present in the auricle or ventricle. (*a*) Tuberculosis of the heart-muscle is rare. The presence of the bacillus in such foci has been demonstrated. Apart from the actual occurrence of the tuberculosis, the heart-muscle may undergo fatty degeneration in tuberculosis; fragmentation, as well as brown atrophy, has also been observed, but fibrosis is rare, and when present may have another cause. (*b*) The valves are not infrequently diseased, but as a rule the lesion antedates the tuberculosis. Occasionally the endocarditis is recent. In one such case the streptococcus alone was found. In 4 others examined bacteriologically by Michaelis tubercle-bacilli were found in the valves or endocardium. (*c*) In one of the author's cases Michaelis found tubercle-bacilli in an antemortem clot in the heart. Leyden draws attention to the presence of living bacilli within the cells, and the possibility of new foci arising from a transportation of such cells to other parts. The presence of bacilli in clots the author attributes to the wandering in of leukocytes containing bacilli. This, we believe, may sometimes happen in the exudate of croupous pneumonia, and thus a genuine pneumonia may pass into a caseating tuberculous pneumonia. Labbé[3] reports 2 cases of **tuberculous myocarditis**—one in a boy of 6, the other in a girl of 4 years.

Banti[4] has studied the anatomic **causes of loss of compensation in valvular heart-disease.** For purposes of study the cardiac lesions divide themselves into the aortic and mitral. In the former disturbances of compensation depend on sclerosis of the coronary arteries and their branches. The changes in the intramyocardial vessels lead to narrowing or obliteration of the

[1] Med. News, May 2, 1896.
[2] Deutsch. med. Woch., Jan. 9, 1896.
[3] Rev. mens. des Mal. de l'Enf., June, 1896.
[4] Centralbl. f. Allg. Path. u. Pathol. Anat., Aug. 31, 1895.

smaller arteries, and this in turn to a simple or degenerative atrophy of the muscular structure, together with hyperplasia of the connective tissue. Small necrotic foci may form which are followed by true scars. The changes in the myocardium are then those of cirrhosis, which, in view of the origin of the fibrous hyperplasia, might be termed *arterial cirrhosis.*

In mitral lesions the mechanism of the disturbance of compensation is different. As a rule, defects of the mitral valve have a shorter course than aortic lesions. Patients with mitral lesions may die in different periods of the disease: 1. In the period of sufficient compensation, in consequence of intercurrent disease. 2. During an early attack of asystole, commonly attributed to fatigue of the heart, death resulting generally from complications, such as embolism, etc. 3. In a more or less advanced period of cardiac cachexia.

The author had opportunities to make autopsies in each of these classes of cases. In the first he found a pure hypertrophy of the myocardium, without microscopic lesion. In the second there was a marked dilatation of the coronary vein and its subepicardial branches; microscopically, the same change was found in the intramyocardial veins and in the capillary network surrounding the muscles. The fibers seemed to be separated by a granular substance soluble in acetic acid and in potassium hydrate. The connective-tissue cells were also the seat of cloudy swelling, and the muscle-fibers of vacuolar degeneration. These changes are evidently due to venous stasis and edema of intermuscular connective tissue and the muscle-fibers. In the cases that died in the period of cardiac cachexia the author found constantly, when the period had lasted sufficiently long, an enormous dilatation of the coronary vein; the walls of the vein and its subepicardial branches were more or less thickened and rigid, resembling walls of arteries. The muscle-cells in the tunica media were fewer than normal or had entirely disappeared. The veins themselves were surrounded by a broad ring of fibrous tissue. The intramyocardial veins were dilated and sclerosed. The muscle-fibrillæ were surrounded by connective-tissue rings, which were thicker and coarser than normal. The origin of this new formation of connective tissue seemed to be the small veins in the intermuscular spaces. The arteries presented no notable change. The muscular fibers were the seat of profound changes, consisting in simple atrophy, vacuolar degeneration, more rarely fatty metamorphosis. In the neighborhood of the veins from which bands of fibrous tissue sprang, the muscle-fibers were often totally destroyed; at some distance simple atrophy was found; vacuolar degeneration existed when the connective-tissue hyperplasia was less advanced. Small areas of hyaline necrosis were also found. The changes described are of a cirrhotic nature, the origin of the fibrous hyperplasia being the veins; it is therefore a *venous cirrhosis*, in contradistinction to the arterial cirrhosis of aortic disease. The development of this cirrhosis is due to disturbances in the circulation in the heart-muscle, which in turn are dependent on imperfect emptying of the coronary vein into the right auricle. The first change affects the muscle-fibers (vacuolar and fatty degeneration), and this facilitates disturbances of compensation. As the myocardial stasis increases, it finally leads to fibrous

hyperplasia, which may remain limited to the veins (phlebosclerosis) or may become a cirrhosis proper. The changes in the myocardium in mitral lesions are thus seen to be analogous to those in the other organs, and to depend on defective contractile power of the myocardium.

Thrombus-like Formations in the Heart.—Bostroem[1] describes 2 very interesting heart-specimens. The first was obtained from a child 3 weeks old, that 3 days before death had become cyanosed, and gradually sinking, had died in collapse. At the autopsy the right auricle was almost completely filled by a globular mass attached to the upper and outer wall of the inner surface of the auricle; its surface was entirely smooth, moist, shining, and grayish-white in color. The cavity of the auricle was reduced to a narrow slit. At first the mass was considered a myxosarcoma, but a careful study of the hardened specimen showed that the mass consisted almost entirely of blood with a surrounding connective-tissue membrane, which was continuous with the wall of the auricle. From this it might be inferred that the mass was a thrombus, but the author gives reasons against this view. At the point of attachment the muscular wall of the auricle was much thinner than normal, its limits very irregular, almost notched, looking as if torn, and the muscle-fibers were separated by a new granulation-tissue. The most striking feature, however, is that this altered muscular wall was in immediate contact with the large blood-spaces of the mass. There was, then, lacking here a part of the muscular wall, the subendocardial tissue, and the entire endocardium. Moreover, in the capsule of the growth, aside from an endothelial covering and subendothelial tissue, muscular fibers were demonstrable; wherefore the author concludes that the mass was the result of a hemorrhage into the muscular wall of the auricle. The cause of this is assumed to be a trauma.

A second communication concerns itself with varices of the auricles and their relation to stalked polypoid thrombi and ball-thrombi. In one of the cases reported a varix 5 cm. long and of the same thickness projected from the posterior lower edge of the open foramen ovale into the right auricle. The varix contained fluid blood and a phlebolith 2 mm. in diameter. Including another case of his own, the author collects 10 cases of varices of the auricles. Nearly all were situated on the posterior quadrant of the foramen ovale. In 9 cases the varix was situated in the right auricle. An additional specimen was found by the author in the collection of the University of Giessen. The mass measured 5.8 by 5.3 by 5.0 cm. (see Plate 7, Fig. 2).

Regarding the significance of these varicose veins, the author believes that they may give rise to polypoid thrombi—one case cited by him seems to confirm this—and also perhaps to a special variety of ball-thrombi. An important point in the diagnosis between a thrombus and a varix is that in the latter the enclosing membrane is separate, independent, and readily peeled off, while in the case of the former it is part of the organized thrombus. We reproduce the plate showing the auricular hemorrhage and the polypoid mass, which, for the reasons given, the author views as a very large varix.

[1] Deutsch. Arch. f. klin. Med., Mar. 13, 1895.

PLATE 7.

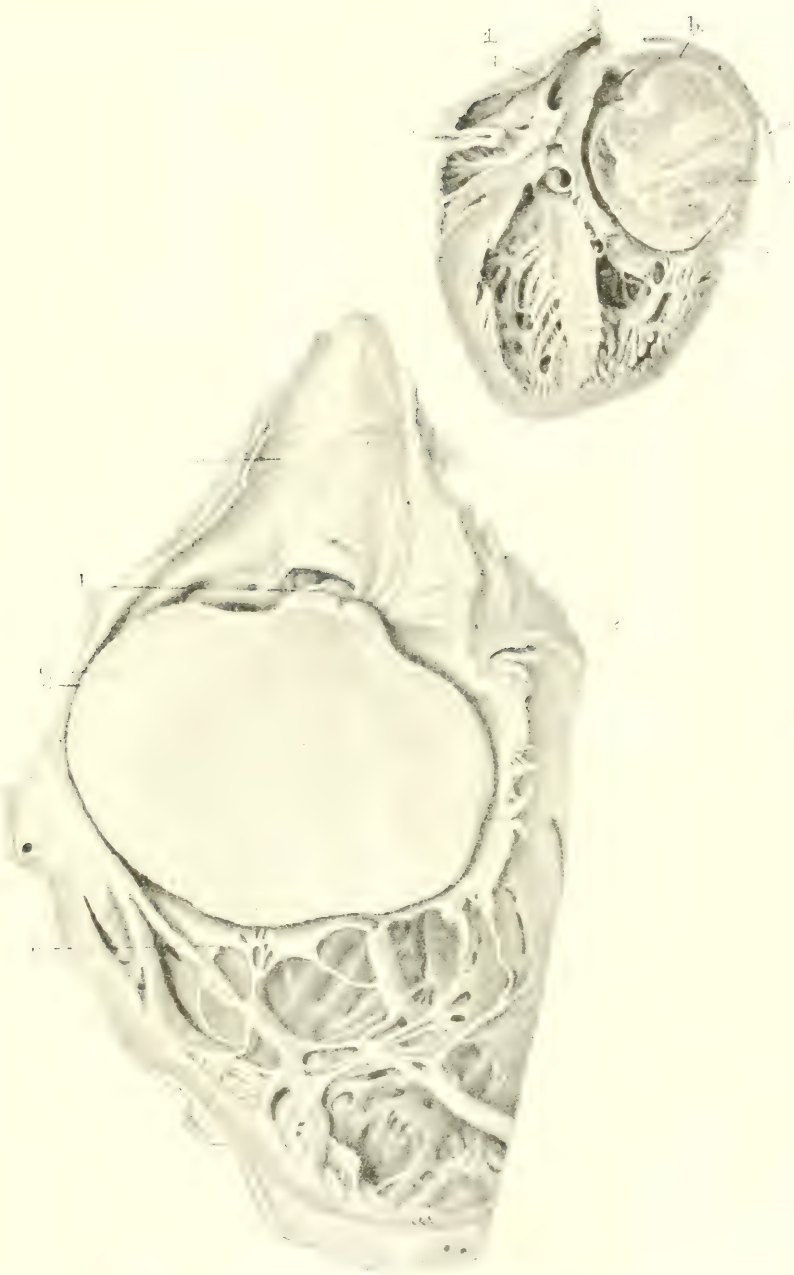


Fig. 1.—*a*, Tumor-like mass; *b*, right upper anterior wall of auricle; *c*, capsule; *d*, point where capsule is interrupted; *e*, pericardial adhesion. Fig. 2.—*a*, Right auricle; *b*, pedicle of *c*, varix; *d*, capsule; *e*, tricuspid valve. (Deutsch. Arch. f. klin. Med., Bd. lv.)

Endocarditis as a Sequel of Gonorrhea.—Dauber and Borst[1] after a review of the relevant literature describe the case of a man who a few weeks after the acquisition of gonorrhea developed a malignant endocarditis of the aortic valve. This was found at autopsy, together with a nephritis. The microscopic examination of the valves, of the heart-blood, of a small abscess in the aortic valve, and of the splenic pulp revealed the abundant presence of a diplococcus which morphologically had all the characteristics of the gonococcus. All nutrient media save one—a serum-agar tube—remained sterile. On the latter minute punctiform, yellowish-brown, translucent colonies developed, which, the authors believe, did *not* consist of gonococci. [In a report on this paper Kolle[2] remarks that the diplococci found may have been gonococci, in favor of which, apart from the morphologic identity, is the fact that despite



FIG. 120.—Syphilitic aortitis (Deutsch. Arch. f. klin. Med., Mar. 13, 1895).

the abundance of organisms in the tissues so few developed on the cultures. This appears to us a pertinent point, but further studies of the endocarditis

[1] Deutsch. Arch. f. klin. Med., Bd. lvi. H. 3 and 4.

[2] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 21, 1896.

following gonorrhea are necessary, particularly culture-experiments by the recent methods.]

Syphilitic Aortitis.—Döhle[1] believes that there is a characteristic form of aortitis due to syphilis. This is characterized macroscopically by stellate cicatricial retractions and pit-like depressions of the inner surface of the aorta (see Fig. 120). A hyperplasia of the intima (chronic endarteritis) may exist in addition. The retractions are produced by diffuse and gummatous inflammations of the media and adventitia, which lead to the formation of cicatricial fibrous tissue. In places the media disappears entirely, and the intima and adventitia are joined by fibrous tissue. The presence of endarteritis alone is not significant of syphilis. In order justly to describe a disease-process as syphilitic, it is necessary to find the cicatricial changes produced by the inflammation of the media and adventitia. Giant-cells are frequently present. Though not characteristic, they are, apart from tuberculosis and syphilis, rarely found in chronic inflammations from other causes. The inflammatory changes in the media favor the formation of aneurysms.

Syphilitic Disease of the Cerebral Arteries.—Wendeler[2] brings

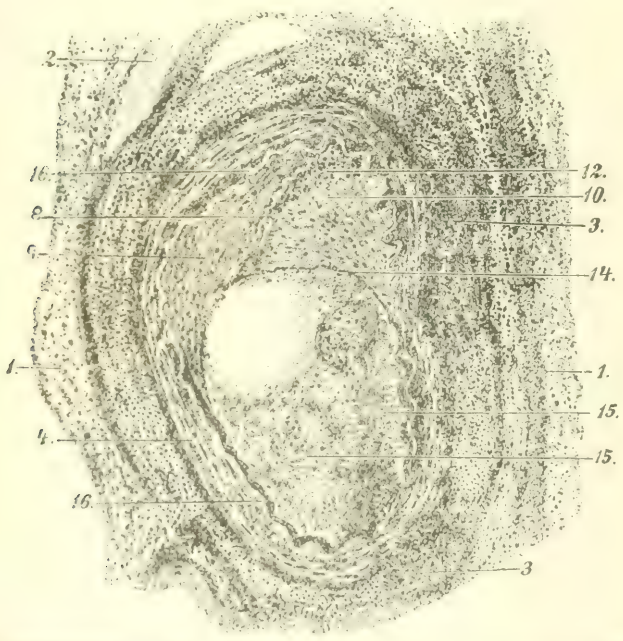


Fig. 121.—Syphilitic disease of the cerebral arteries (Deutsch. Arch. f. klin. Med., Mar. 13, 1895).

forth one important point—namely, that in syphilitic endarteritis there is found, as evidence of the "*schubweise*" proliferation, a new formation of fenestrated membranes. As he has never observed these in endarteritic processes of nonluetic origin, he concludes that the formation of new, well-characterized fenestrated membranes, which are separated by newly-formed

[1] Deutsch. Arch. f. klin. Med., Mar. 13, 1895. [2] Ibid.

tissue from the original one, and which are to be considered as an expression of the interrupted development of the syphilitic endarteritis obliterans, is



FIG. 122.—Syphilitic disease of the cerebral arteries (Deutsch. Arch. f. klin. Med., Mar. 13, 1895).

diagnostic of syphilis, although its absence does not exclude syphilis. We reproduce three of the illustrations (Figs. 121–123).

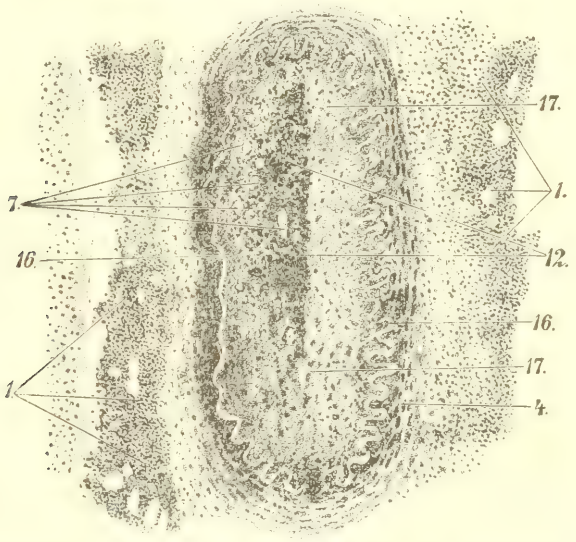


FIG. 123.—Syphilitic disease of the cerebral arteries (Deutsch. Arch. f. klin. Med., Mar, 13, 1895).

Explanation of Reference Numbers on Figs. 121–123.—1, Pia mater infiltrated with leukocytes; 2, fibrinous exudate between pia and adventitia of artery; 3, marked infiltration of adventitia; 4, normal media; 7, vascular formation in the endarteritic hyperplasia; 8, newly-formed fenestrated membrane placed between two foci of endarteritic hyperplasia; 9, 10, hyperplasia of intima formed at two periods; 12, leukocytic infiltration into the endarteritic hyperplasia; 14, newly-formed endothelial membrane; 15, fibrin-mass in vascular lumen; 16, normal fenestrated membrane; 17, endarteritic hyperplasia.

Syphilis and Atheroma.—Weber[1] in a paper on syphilis and the etiology of atheroma enunciates the following conclusions: 1. Atheroma of the aorta, though often preceded or accompanied by inflammation, is itself a merely

[1] Am. Jour. Med. Sci., May, 1896.

degenerative process; syphilitic or other inflammation may locally predispose to atheroma. 2. Aneurysm of the aorta is induced more often by the yielding of a portion of its wall affected by syphilitic or other inflammation than of a portion affected by simple atheroma.

THE NERVOUS SYSTEM.

Spinal-cord Changes in Carcinoma of the Stomach.—Lubarsch[1] found degenerative changes in the posterior columns and posterior roots of 6 cases of carcinoma of the stomach. He believes they are due to the absorption of decomposed stomach-contents.

Progressive Muscular Atrophy.—Cramer[2] publishes an excellent report on the pathologic anatomy of progressive muscular atrophy, from which we abstract the following conclusions: 1. There are muscular atrophies in which, with our present methods, changes cannot be found either in the central or the peripheral nervous system, even in cases of long duration. These atrophies clinically belong as a rule to the type which Erb has grouped together as dystrophy. 2. The muscular atrophies in which a spinal affection is demonstrable present a very variable clinical picture. With the same spinal lesion we may find the symptom-complex of a dystrophy, as also of a spinal muscular atrophy. Even an isolated lesion of the cells of the anterior horns may produce such different disease-pictures. We may, therefore, find in dystrophy a spinal lesion or an intact central and peripheral nervous system. 3. There are transitional cases between those without central and peripheral nervous lesion and those with spinal changes, as also between those of the so-called spinal muscular atrophy and the atrophies found in other diseases of the spinal cord. 4. The muscular changes in the atrophies with spinal lesion and in the myopathies without such lesion are in the main the same, and present nothing characteristic for the different forms. 5. The pathogenesis of the muscle-atrophy is still obscure, but it is probable that an embryonal tendency (*Anlage*), which is hereditarily transmissible, is the causative factor. Whether this supposed embryonal defect affects the nervous system or the musculature directly is undecided. 6. Cases of muscle-atrophy exist with isolated disease of the peripheral nerves, and they are characterized by a special type (neural form of Hoffmann). The muscular changes do not differ materially from those in the other two muscular atrophies. 7. A certain resemblance to those cases is presented by the muscular atrophy of tabes. 8. There are cases of muscle-atrophy of cerebral origin—chiefly cases of focal lesions in the region of the central convolutions. They may develop without any lesion of the pyramids or the cells of the anterior horns of the spinal cord.

Chronic Anterior Poliomyelitis in Diabetes.—Nonne[3] reports a case of atrophic palsy of the upper extremity in a diabetic woman aged 64.

[1] Berl. klin. Woch., Sept. 30, 1895.

[2] Centralbl. f. Allg. Path. u. Pathol. Anat., Aug. 31, 1895.

[3] Berl. klin. Woch., 1896, No. 10.

The palsy began in the arm 1½ years previously and spread to the lower extremities. The diabetes had lasted 4 years.

Multiple Sclerosis.—Redlich[1] discusses the pathology of multiple sclerosis, of which he has examined microscopically about 20 cases. There are three chronic forms: 1. The first form is characterized by dense sclerotic patches, seen especially in the posterior columns. These in transverse section of the cord are formed of granules or points, very delicate parallel fibrillæ, and neuroglia-cells, the processes of which are more numerous and more distinct than in normal cords. Many of the fibrillæ can be traced to these cells, but appear often merely to pass through them, as Weigert has described for the normal neuroglia. The granular appearance is due to transverse section of the fibrillæ. Scattered nerve-fibers more or less altered are found in the sclerotic areas; most of them show changes in the medullary sheath, which may even be absent. The axis-cylinder may be normal, but usually is altered, being swollen or reduced in size. 2. A second type consists of coarse neurogliar trabeculæ not forming distinct foci. They are formed by a thickening of the neuroglia—partly by division of the neuroglia-cells, but chiefly by increase of the neuroglia-fibers. It is impossible to decide whether all the fibrillæ are in connection with neuroglia-cells. The walls of the vessels are often much thickened, poor in cells, and have undergone hyaline degeneration. The neuroglia about the vessels is increased in amount. The sclerosed vessels are not regularly located within the foci, and the vascular change cannot be considered primary. 3. A third form consists of a loose network of slightly thickened trabeculæ, with neuroglia-cells at the points of intersection. Such foci stained with carmin appear light, and are usually near the dense sclerotic patches and close to the periphery of the cord. They are probably due to a relatively rapid destruction of nerve-fibers.

The patches in multiple sclerosis are often symmetric, and are frequently located on both sides of the anterior fissure, but do not correspond to the distribution of any vessel, and are less marked in the lower parts of the cord. The motor ganglion-cells are very resistant to the sclerotic process. In the subacute forms the changes are somewhat different. Fatty cells and acute degeneration of the myelin are noted; sometimes the trabeculæ are a little thickened. The vessels are distended, and their walls infiltrated with cells. Sclerotic foci are common in the pons, but rare in the mid- and interbrain, and are not uncommon in the medullary substance of the hemispheres. They have never been observed in the peripheral nerves. There is nothing histologically characteristic about them except their arrangement. The process is not truly inflammatory, as there are no extravasations or swelling of the tissues; it is more likely degenerative, and probably begins in the nervous elements.

Lapinsky[2] reports 2 cases which clinically presented themselves as spastic paraplegia, but which anatomically proved to be disseminated sclerosis.

[1] Arbeit. a. d. Institut f. Anat. u. Physiol. des Centralnervensystems, edited by Prof. H. Obersteiner, No. 4, 1896.

[2] Zeit. f. klin. Med., 1895, xxviii. p. 362.

The Origin of Tabic Amyotrophy.—Schaeffer[1] has examined the cord from an advanced case of tabes with arthropathy of the knee-joint by the method of Nissl to determine the origin of tabic amyotrophy. While some (Déjérine) consider the tabic amyotrophies due to lesions of the peripheral nerves, others (Charcot and Pierret, Leyden, Condoléon) consider them of central origin. Schaeffer found the cells of the anterior horns of the cervical cord practically normal, but those in the lumbar cord were greatly altered, due to changes in the distribution and arrangement of the chromatic substance. The anterior roots were intact. It is true that in nearly every case of tabic atrophy there is a peripheral neuritis, but this does not exclude a central affection, and does not mean that the peripheral affection is independent of that in the motor cells. The tabic atrophy may have its origin in the primary affections of the cells of the anterior horns. The altered trophic function of the cell is shown first at the most peripheral part of the nerve-fiber, and the intervening portion of the nerve may be intact. In tabes the changes in the ganglion-cells are of very slow development. Destruction of the reflex collaterals from the posterior roots removes much of the stimulus to the cells of the anterior horns, and this leads to structural changes.

Lepra-bacilli in the Spinal Cord of a Fatal Case of Syringomyelia.—Pestana and Bettencourt[2] report an interesting case which, while giving some support to the assertion of Zambaco Pacha as to the true nature of syringomyelia, in the end only proves, as the authors themselves state, that some cases of syringomyelia may be due to leprosy of the nervous system. Their case, a man of 46, presented the symptoms of syringomyelia. At the autopsy the disease was found chiefly in the cervical region. Gliomatous nodules were also found in the bulb. In the lower part of the latter the cavity began; at the same point began a sclerotic process, which grew more prominent lower down. The thickened pia sent in large fibrous trabeculæ into the bulb; there was new formation of blood-vessels and periarteritis. In the cord the changes were more marked, and on staining numerous groups of lepra-bacilli were found. An animal was inoculated with an emulsion of the contents of the syringomyelic cavity, but no disease-phenomena followed, and at the autopsy nothing abnormal was found. The authors conclude that the bacilli were lepra-bacilli and not tubercle-bacilli.

Landry's Paralysis.—Bailey and Ewing[3] found the following lesions in a case of Landry's paralysis in which the nervous system was stained by Nissl's method: Filling of the vessels of the cauda equina; axis-cylinder normal; in some of the nerve-roots perivascular infiltration of round cells; in the spinal cord extensive involvement of the gray matter; intense congestion of all the blood-vessels, especially the anterior branches of the spinal artery; nearly all the vessels showed perivascular infiltration of round cells. There was a diffuse cellular infiltration of the gray matter, at times extending slightly into the

[1] Rev. Neurol., No. 4, 1896.

[2] Centralbl. f. Bakt., Parasit. u. Infektionskrank., May 23, 1896.

[3] Jour. Nerv. and Ment. Dis., May, 1896.

white matter; the central canal was not specially affected. There was more or less complete absence of chromophilic masses in the cells. In the areas where the exudative inflammation was most pronounced, many shrunken cell-bodies without visible cell-nuclei were recognized with difficulty. The lesions were most pronounced in the cervical region. In the medulla the lesions were similar, being most marked in the nuclei of the 6th and 7th nerves. The basal ganglia showed perivascular lesions and foci of cellular infiltration. Throughout the cerebral cortex lesions similar to those in the cord were found. The authors hold that acute ascending paralysis is probably a toxemia, affecting chiefly the spinal cord or medulla, although the cortex and the peripheral nerves might become involved. Diller and Meyer [1] report a case of Landry's paralysis in which the spinal cord presented no macroscopic changes. On microscopic examination the crossed pyramidal tracts were distinctly outlined and more faintly stained than the anterior horns, due to a decrease of medullated fibers and the presence of an increased amount of neurogliar tissue with distended blood-vessels. Defects were also noticed in the posterior columns, but were probably due to postmortem change. Remlinger [2] reports a case of Landry's palsy in a young man, fatal in 11 days. There was no macroscopic lesion in the cord; bacteriologic examination gave pure cultures of the streptococcus.

Polyneuritis with Lesions of Reaction at a Distance in the Spinal Cord.—Marinesco [3] describes a case of polyneuritis in which degeneration was found in the peripheral nerves of the lower extremity; the sciatic nerve was much less involved; the anterior spinal roots were *perfectly* healthy; changes were found in the cord, but only in the lumbar swelling. Here the posterior external group of cells was found diseased when examined by the method of Nissl. As the anterior roots were intact, these changes were due to reaction at distance (*reaction à distance*), were secondary, and were not necessarily permanent. Primary lesions of the cord involve the trophoplasm (unstained portion) as well as the kinetoplasm (chromatophilic elements), and such lesions are irreparable.

The Vascular Changes in Tuberculous Meningitis.—Hektoen [4] in an elaborate article discusses the vascular changes of tuberculous meningitis, especially the tuberculous endarteritis. Nine cases were studied, serial sections being made of the arteries, particularly those in the Sylvian fissure. Extensive vascular changes were present in all of the 9 cases of tuberculous meningitis. From the changes found, together with the usual presence of multiple tuberculous processes in various organs, the inference is justified that the meningitis was of hematogenous origin. The arterial lesions found indicated that an invasion of the wall frequently occurred from within. While the wall in these cases also presents diffuse changes—changes that especially

[1] Am. Jour. Med. Sci., April, 1896.
[2] Compt. rend. de la Soc. de Biol., April 3, 1896.
[3] Ibid., May 16, 1896.
[4] Jour. of Exper. Med., Jan., 1896, vol. i. No. 1.

involve the adventitia, from which they may spread inward—there are also very extensive and important changes in which the intima plays the essential part. Tubercles in the intima may occur in association with more or less diffuse changes in the other coats, accompanied with an extensive endarteritis, or they may occur without any other changes of the arterial segment in the intima of which they are situated. Associated with these typical tuberculous changes is an endarteritis that may occur independently or be connected with infiltration in the media and the adventitia. The presence of this endarteritis without changes in the other layers of the wall, but being confined to the internal surface of an artery throughout its entire extent, shows conclusively that this form of intravascular lesion in tuberculous meningitis may be primary and due to inflammatory agents circulating in the blood. Bearing the fact in mind that such extensive and undoubtedly primary intimal lesions may be present in tuberculous meningitis, it will become exceedingly difficult, if not entirely impossible, to decide where the process may have had its point of origin in the case of more or less diffuse involvement of the arterial wall when associated with endarteritis. Invasion of the media and of the intima from without certainly occurs in tuberculous meningitis as well as elsewhere; as, for instance, in the lungs, and with great frequency. This is shown best by the presence of diffuse or circumscribed adventitial proliferation that gradually extends into the media and reaches the intima perhaps only at one point. In this way an endarteritis due to direct extension from without may arise and extend along in the intima. It seems, however, that an endarteritis distinctly traceable from without rarely reaches the extent of the primary endarteritis. Intimal tubercles with giant cells were not found upon the arteries, in which it could be shown with certainty that the process invaded the arterial wall from without. The tuberculous endarteritis that has been described as occurring primarily and independently of changes in the outer arterial coats demonstrates that tubercle-bacilli are implanted in the intima. The intact endothelium usually present shows that the bacilli must reach the subendothelial layer at once after passing through the endothelial lining. After detailing an experiment in which meningeal and cerebral miliary tuberculosis was produced in a rabbit by injecting bacilli into the carotid artery, and in which the tubercles were found to have developed in connection with the smaller arteries, the author sums up his results in the following conclusions: 1. In tuberculous meningitis there is a tuberculous endarteritis characterized by the formation of intimal tubercles and a diffuse subendothelial, intimal proliferation due to implantation of tubercle-bacilli from the blood. From the endarteritis the infiltration may spread into the muscular coat and the adventitia, and the whole wall may undergo caseous and hyaline degeneration. 2. Tuberculous proliferation in the adventitia may invade the media and the intima, and the whole wall of the arterial segment may undergo degeneration. 3. The veins are constantly the seat of more or less extensive infiltration, which always results from adjacent extravascular or arterial foci. 4. The epithelioid cells of the subendothelial, tuberculous, intimal proliferation

are most likely derived from the subendothelial layer of connective tissue, and not from the endothelial lining.

Cornil and Durante[1] found a pure growth of Pfeiffer's influenza-bacillus in the pus of the pia mater of a woman dead of meningitis, and consider this organism as the cause of the disease.

Hektoen[2] reports a case of **gumma of the hypophysis** in a woman aged 45 years.

Francis,[3] in conjunction with Starr and Van Gieson, reports a case of **neuroglioma of the corpus callosum** in a woman aged 45 years. The tumor measured $5 \times 5 \times 5\frac{1}{2}$ cm., and merged into the tissues of the hemispheres. Localizing signs were absent.

Taylor[4] reports a very interesting case of **secondary sarcoma of the brain** following a primary chondroadenosarcoma of the testicle. The brain-tumors were sarcomatous; in the lung some of the nodules were sarcomatous, others consisted of hyaline cartilage and of glands lined with cylindric epithelium and often dilated into small cysts. Councilman suggested that the secondary growths in the brain were metastatic from the nodules already developed in the lung.

The Action of Alcohol on the Cortical Nerve-cell.—Berkley[5] has studied the changes produced in the brains of rabbits fed for a long period on alcohol. The vascular changes were slight. Very marked departures from the normal were observed in the nerve-elements. In the specimens stained by Nissl's method the nuclei were much altered; the nucleolus appeared rough, spongy, or had elongated projections from the surface; the nucleus was roughened and enlarged. The specimens hardened in Müller's fluid and stained by the author's method (phosphomolybdate of silver in free nitrate of silver) presented the following changes: Tumefactions in the protoplasmic processes of the pyramidal cells of the cortex, and a loss of gemmulæ of the dendrites. The axis-cylinder and its collaterals were normal. The same changes were found in the Purkinje-cells of the cerebellum. The neuroglia in both cerebrum and cerebellum was normal. The author attributes the lesions to a direct action of the poison on the protoplasm of the nerve-cells.

[These investigations—and they have been confirmed with respect to other poisons—raise the interesting question why the prolonged use of alcohol produces interstitial changes in the liver and kidney, in man at least, and parenchymatous changes in the nervous system. As far as we know, no explanation has as yet been offered for this difference in response to the same morbific agent. Poisons acting acutely, as those of the infectious diseases, seem in the main to affect the parenchymatous structures of all organs, the liver and kidney as well as the nervous system.]

The Spinal Lesions caused by Tetanus-toxin.—Marinesco[6] exam-

[1] Bull. de l'Acad. de Méd., 1895, xii. Série, t. xxxiii. p. 469.
[2] Jour. Am. Med. Assoc., June 6, 1896.
[3] Am. Jour. Med. Sci., June, 1895.
[4] Boston M. and S. Jour., Jan. 16, 1896.
[5] Am. Jour. of Insan., July, 1895.
[6] Compt. rend. Soc. de Biol., July 4, 1896.

ined the spinal cords of 3 guinea-pigs that had been inoculated with tetanus-toxin. He found small diffuse hemorrhages in the gray substance, most numerous in the anterior horns; the chromophilic elements of the nerve-cells were smaller and altered in shape, in some places changed into granules scattered through the cell-body. In some preparations these elements had disappeared at the periphery of the cells, as has also been seen in hydrophobia and in anemia of the cord from compression of the abdominal aorta; in other preparations they had disappeared also at other parts. The protoplasmic processes presented lesions similar to those of the cell-body. The achromatic substance was deeper in color. In some preparations, where the configuration of the cell was preserved, the entire cell was deeply stained and the altered chromophilic elements could scarcely be seen. The changes were found in the cells of the posterior as well as those of the anterior horns. In the earlier stages the nuclei were not much affected, but in the later their contour was less distinct, the coloration more intense, and the nuclear network had disappeared. The neuroglia-cells were larger. In the later stages of the disease degenerative changes were found in the white substance, and were probably due to alteration in the column-cells.

THE DIGESTIVE TRACT.

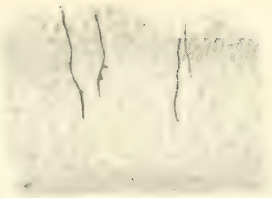
Malignant Disease of the Peridental Membrane.—Smith[1] describes tumors springing from the peridental membrane. They are alveolar round-cell sarcomata, containing also many spindle-cells, and occur especially in the periosteum of the molar teeth, particularly the upper. The tumors vary in size from that of a split pea to a small nut, and have a smooth, convoluted, rarely ragged surface. They are firm and of a deep-red color, and seem to be most common in women at the period of the menopause. If the tooth is not removed, malignant disease of the jaw may follow.

Charrin[2] describes a **submaxillary abscess** due to the oidium albicans.

Thrush.—Heller[3] examined 25 bodies in which thrush had been found. In 18 cases in which the esophagus was examined, it was but once found free from the thrush-fungus; once the fungus involved only the epithelium, 7 times the connective tissue, 9 times the connective tissue and the blood-vessels; thrombosis of the affected vessels occurred in 6 cases; once spore-formation was found in a vessel; 3 times the fungus entered the mucous glands; 7 times ulceration was present, always with fungi in the connective tissue; once the threads penetrated into the muscularis. In 7 cases in which the larynx was affected the fungus was confined to the epithelium only twice; in 5 cases it had penetrated into the connective tissue. Similar observations were made on the pharynx and trachea. The lungs were examined in 4 cases: in 2 no fungus was found, in 1 a few threads in pneumonic areas, in 1 case large masses in a dilated bronchus. Fungi were also found in a chronic ulcer of the stomach. In a total of 38 organs examined, 5 were free from thrush;

[1] Lancet, July 6, 1895.
[2] La Sem. méd., 1895, No. 29.
[3] Deutsch. Arch. f. klin. Med., Mar. 15, 1895.

PLATE 8.



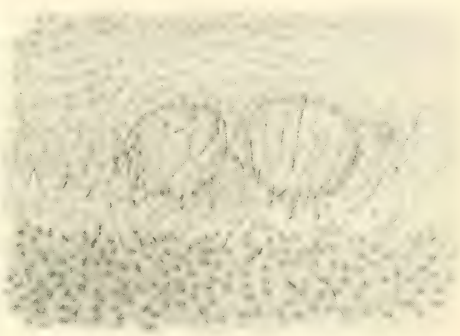
1



2



5



3



4

FIG. 1.—Section of tracheal mucous membrane; threads of thrush-fungus wander through the apparently normal cylindric epithelium into the connective tissue. FIG. 2.—Numerous threads of the fungus in the apparently normal epithelium of a lingual papilla; several have penetrated into the connective tissue. FIG. 3.—Fungus growing through two blood-vessels of the esophagus. FIG. 4.—Cross-section of the esophagus of a child: concentric advancement of the fungus into the deeper parts; partial necrosis and exfoliation of the mucosa. FIG. 5.—Small portion of the same preparation more highly magnified. (Deutsch. Arch. f. klin. Med., Mar. 15, 1895.)

in 4 only the epithelium was affected; in 17 (51.6%), the fungus had penetrated into the connective tissue; in 12 (36.3%), into the blood-vessels, of which 6 were thrombosed; in 9 cases ulcers were present. The epithelium shows no special changes; the connective tissue presents a well-marked reactive inflammation. Metastasis was not observed, and is so far recorded in but 2 cases. The thrombosis of the vessels may explain its rare occurrence. Apart from the local changes produced by the fungus itself, which the author says are not rarely responsible for the serious turn of an otherwise mild disease, it may cause lesions through which bacteria may enter, and cites a case of purulent meningitis and sinus-thrombosis in which the only portal of entrance could have been a necrotic patch of thrush on the vocal cords. (See Plate 8.)

Stooss[1] publishes a series of studies on the etiology and pathology of angina, stomatitis aphthosa, and thrush. In 12 cases of aphthous stomatitis he found constantly a large diplococcus, the properties of which he describes. Less constantly the staphylococcus, "coccus conglomeratus," and other bacteria were found. The author believes that aphthæ are due to the large diplococcus, which is not found in the normal mouth nor in the ordinary anginas. In regard to thrush, he believes that cocci, by causing a stomatitis erythematosa, prepare the mouth for the action of the thrush-fungus.

Bacteriology of Nondiphtheric Angina.—Lemoine[2] has made a careful study of nondiphtheric anginas. Heretofore the organisms found at the diseased focus have been considered pathogenic, without regard to the possibility that as constant inhabitants of the mouth they might be present saprophytically. Lemoine escaped this error by taking the material for cultivation from the interior of the tonsil by means of a pipet, after a preliminary cauterization of the point of puncture. In this way, as well as in a number of instances by the old method, he examined 112 cases of scarlatinous angina, 74 of which presented a membrane, 29 nondiphtheric anginas with membrane, 14 ordinary anginas running a grave course, and a few other anginas, 3 of which were cases of hypertrophy of the tonsils. Excluding the last 3, there remained 165 anginas; in all the streptococcus pyogenes was found, and always in pure culture. When cases were examined without puncture of the tonsils, other bacteria were found, as well as the streptococcus. The 3 cases of hypertrophy of the tonsils showed a bacillus of the colon group. Clinically, there was no difference between the pure streptococcus-anginas and those in which other microorganisms were also present. The virulence of the streptococci toward animals was very variable. Lemoine classes all anginas (those nondiphtheric) as streptococcus-infections, and states that pure streptococcus-anginas (contrary to the usual teaching) may run as grave a course as a grave diphtheria due to the Klebs-Löffler bacillus.

Pepsin in Gastric Diseases.—Oppler[3] finds that pepsin is decreased

[1] Mittheil. aus klin. u. mediz. Institut. der Schweiz, iii. Reihe, H. 1, 1895; ref. in Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 21, 1896.

[2] Ann. de l'Instit. Pasteur, Dec., 1895. [3] Centralbl. f. innere Med., 1896, 5, p. 12.

in chronic gastritis, carcinoma, atony, and dilatation of the stomach; it is increased in ulcer, acid gastritis, chronic gastrorrhea, and sometimes in chlorosis. It seems to go hand in hand with the formation of hydrochloric acid.

Mycoticopeptic Ulcer of the Stomach.—Nauwerck[1] holds that many cases of gastric ulcer begin as hemorrhagic erosions, and that some of these erosions are mycotic in origin, the hemorrhage being in reality a secondary and subordinate phenomenon. Two cases are reported in support of this view. In the one, a youth of 16, who died of heart-disease following rheumatic polyarthritis, the edges of the ulcer showed masses of bacteria—streptococci and diplococci; small areas of necrosis were also present. In the second case, a girl of 7 years, dead of scarlet fever, the stomach showed punctiform hemorrhages, with slight defects of the mucosa, and in the lesser curvature a linear superficial ulcer without hemorrhagic infiltration. Microscopically, the lesions showed the presence of streptococci. This was, then, a septic ulcer. Other infections may produce the same result, as, *e. g.*, the rheumatic poison.

Development of Carcinoma in Gastric Ulcer.—Kelynack[2] records an undoubted case of the occurrence of a cancerous growth in a simple ulcer of the stomach.

Tumors of the Stomach.—Hansemann[3] at the Congress of German Physicians and Naturalists at Lübeck reported the following rare tumors of the stomach: A myoma, with metastasis to the liver and kidney; a myxomatous tumor, with a huge neoplasm of a different nature in the liver; a sarcoma, with hyaline degeneration and calcareous bodies on the outside of the stomach and adherent to the omentum; a submucous tumor, presenting microscopically a resemblance to the cortical substance of the suprarenal capsule. He is not prepared to class the last as related to suprarenal tissue.

False Diverticula of the Intestine.—Hansemann[4] discusses the origin of false diverticula of the intestine. Acquired intestinal diverticula are of two kinds: true diverticula—circumscribed dilatations of the intestines consisting of all the layers; and false diverticula—hernial protrusions of the mucous membrane through the muscular coat. The latter occur especially in the small intestine, on the concave side, and are usually described as being between the layers of the mesentery. Hansemann found in an old man, without history of intestinal trouble, about 400 diverticula, varying in size from that of a hempseed to that of a large pigeon-egg. A few were in the duodenum; in the jejunum and upper ileum they occurred in regular rows. The ascending colon contained none; in the descending colon and sigmoid flexure they were very numerous. Their origin was not in the mesentery, but just alongside of it. In the large intestine true diverticula were present on the convex side, some into the epiploic appendages. On the outside of the intestine small vessels were seen passing from the mesentery by the side of or upon the diverticula, and within the bowel various branches converged into them.

[1] Münch. med. Woch., Sept. 17, 1895.
[2] Brit. Med. Jour., Jan. 18, 1896.
[3] Centralbl. f. Allg. Path. u. Pathol. Anat., Oct. 15, 1896.
[4] Virch. Arch., May, 1896, Bd. cxliv. p. 400.

The diverticula were herniæ of the mucous membrane into the sheath of veins, the muscular layer stopping at their edge, even in the case of the smallest. At this location there is a place of least resistance, as can be proved by distending the intestine with water, when similar protrusions occur temporarily.

Obliteration of the Appendix Vermiformis.—Piersol [1] has studied this question, to which attention has recently been given by Ribbert and Zuckerkandl. The appendix attains its fullest development from the tenth to the twentieth year. As the age advances changes take place in the mucosa and submucosa which lead to more or less complete obliteration of the lumen. The first evidence of retrogressive change is a diminution of the size, particularly of the height, of the lymphoid follicles; Lieberkühn's follicles also atrophy. Subsequently the mucosa suffers a general invasion by lymphoid cells. Following the disappearance of the atrophic glands, the opposed surfaces of the mucosa may become united, and the process may be so complete that all traces of the lumen and the mucosa become effaced. These changes must be regarded as phases of a process of involution. Ribbert found them in 99 out of 400 appendices (25%); Zuckerkandl, in 55 out of 232 (23.7%).

Perforation of Intestine by a Polyp.—Zahn [2] reports a case of perforation of the intestine by a rectal polyp.

Cholera Nostras.—Pottien [3] found in the stools of 3 cases of cholera nostras, one fatal, the bacillus fluorescens capsulatus.

Hematogenous Jaundice.—According to Auld [4] the view of Frerichs that jaundice might be caused by the absorption of bile from the intestine has been disproved. Kühne's theory of the origin of a hematogenous jaundice from destruction of the red corpuscles in the blood was overthrown by the experiments of Minkowski and Naunyn. These observers caused ducks and geese to inhale arseniuretted hydrogen, which induced a speedy development of bilirubinuria. On removing the liver from a duck presenting bilirubinuria, hemoglobinuria resulted, with a distinct fall in the bilirubin excreted. At death the urine was free from bilirubin, likewise also 35 c.c. of blood. Subjecting 2 geese, one of which had been deprived of its liver, the other for purposes of control, to the action of arseniuretted hydrogen, the latter had bilirubinuria, the liverless goose only hemoglobinuria.

The jaundice produced by toluylendiamin (Stadelmann, Afanasiew, Hunter) is not hematogenous, but hepatogenous. In many instances, indeed, it is truly obstructive, but in others the poison produces a disturbance in the liver by which a partial deflection of the bile occurs into the lymphatics, and thus into the blood. The author himself experimented with toluylhydrazin and metaphenylendiamin. When slowly introduced they produced a subacute poisoning characterized by jaundice and icteric urine. At the autopsy the spleen was greatly enlarged; the gall-bladder contained but little bile; there was no obvious catarrh of the ducts or duodenum. Microscopic-

[1] Univ. Med. Mag., Sept., 1895. [2] Virch. Arch., Jan., 1896, Bd. cxliii. p. 187.
[3] Zeit. f. Hyg. u. Infektionskrank., 1896, xxi. 1, p. 140.
[4] Brit. Med. Jour., Jan. 18, 1896.

ally, the spleen was found to be enormously charged with pigment of a golden-yellow color. In the liver the portal vein and the capillaries were highly colored by this pigment, carried over, the author holds, from the spleen, which is the organ of blood-destruction. The liver-cells were quite devoid of pigment; they were pale, and in a condition of fatty degeneration. The blood of the hepatic veins contained much pigment, and in the kidney pigment-granules were seen amongst the cells of the convoluted tubules and in the lumina of the straight tubules. It was indisputable that the granular pigment brought to the liver from the spleen was carried over in abundance into the general circulation, and there can be no doubt that pigment existing in soluble form in the blood-plasma was also carried over. Thus, while the liver is ordinarily most active in disposing of the products of blood-destruction, a further stage may be reached in which the liver apparently refuses any longer to deal adequately with those products, its cells undergoing degeneration. The result of this is that the pigments of reduced hemoglobin will be carried beyond the liver into the general circulation, stain the tissues, appear in the urine, and so bring about a true hematogenous jaundice. Two factors are necessary for the production of such a jaundice—an excessive destruction of blood in the spleen, and an inefficient or paralytic condition of the liver-cells. This hematogenous jaundice corresponds to the jaundice brought about by the absorption of the decomposition-products of a large extravasation of blood; the hematoidin of this is, as Virchow has shown, identical with bilirubin. [These are interesting facts, and on their face bear the stamp of probability. They seem to prove the long-disputed occurrence of hematogenous jaundice. They teach us that in yellow fever, pyemia, and other infectious fevers in which jaundice may be present the spleen should be examined as to its pigment-content. If the conclusions are verified by future experiments, we shall be compelled to hold that the liver has but little to do in actively elaborating the bile.]

The Pathology of Jaundice.—Hunter,[1] in researches on the action of toluylendiamin, comes to the same conclusions as Stadelmann, that the jaundice produced by it is in reality due to obstruction. The author believes that an irritative derivative of the poison is excreted in the bile, and induces catarrh of the bile-passages and duodenum. The involvement of the duodenum is secondary to that of the bile-passages, and only occurs in severe cases.

Chronic Perihepatitis (Zuckergussleber of Curschmann).—Rumpf,[2] after briefly describing Curschmann's original case of perihepatitis (Zuckergussleber) details the following instance: A married woman suffered for 15 years from ascites, for which she was tapped 301 times, the quantity of fluid removed varying from 10 to 20 liters. There was enlargement of the spleen; digestion was good; in fact, the functions of the gastrointestinal tract were performed normally throughout her long illness. The autopsy revealed

[1] Jour. of Path. and Bacteriol., Aug., 1895; Brit. Med. Jour., Nov. 16, 1895.

[2] Deutsch. Arch. f. klin. Med., Mar. 13, 1895.

diffuse, chronic hyperplastic perihepatitis, with very marked compression of the otherwise normal liver-tissue; ascites, chronic hyperplastic perisplenitis and parietal peritonitis, diffuse chronic hyperplastic pericarditis, with obliteration of the pericardial sac; right-sided chronic exudative hyperplastic pleuritis; relative insufficiency of the tricuspid valve; edema of the lungs. On section the liver nowhere presented a trace of hyperplasia of the interstitial tissue. The organ was reduced one-half in size, and was covered by a uniform white mass, looking as if congealed. The edges were rounded; the gall-bladder could not be found. The white layer on the liver had a thickness of from 8–14 mm., and was very firm. The kidneys were normal. A microscopic examination was not made. [The condition is very rare; only a few positive cases are recorded. Perihepatitis *with* cirrhosis of the liver is, however, not so infrequent. The diagnosis is difficult; we can only allude to the most important points in the differentiation from hepatic cirrhosis: the absence of signs and symptoms of stasis in the gastrointestinal tract and the long duration are the most important. It is difficult to find a good English equivalent for the German term—we would suggest "icing-liver." In a case studied by one of us recently—a case of cylindric carcinoma of the intestine—the liver was surrounded on its upper surface by a very much thickened capsule, and was partly adherent to the diaphragm. On microscopic examination it was found that the peritoneum was the seat of secondary carcinoma.]

Fussell and Kelly[1] report 2 cases of primary **carcinoma of the liver with cirrhosis.** In Case 1, an Italian aged 44 years, the liver was enlarged, granular, reddish-white, suggesting in appearance a huge carcinoma. Nowhere could a sign of new growth be discovered, the surface of section presenting a uniform lobulated character. Microscopic examination showed cirrhosis of the hypertrophic form; the intralobular biliary canaliculi were increased in number and size. The liver-cells were almost entirely replaced by epithelial cells in the form of tubular cylinders, which seemed to have their origin in the liver-cells themselves (trabecular epithelioma). There was no metastasis to other organs. In the second case, a girl of 16, the liver weighed $3\frac{1}{4}$ lb. and was not hard; the surface was glistening and granular. Small nodules, from the size of millet-seed to that of a pea, were scattered throughout the liver; a somewhat larger mass was found on the surface of the left lobe, and another in the depth of the right lobe. Microscopic examination showed an increase of the connective tissue of Glisson's capsule, and a marked increase in the intralobular biliary canaliculi. The liver-cells were enlarged and cloudy, and on the periphery of certain lobules a probable change from liver-cells into cancer-tissue could be seen. The authors hold the sequence of events in cases of cirrhotic cancer to be as follows: (1) Cirrhosis with hyperplasia of the liver-cells. (2) The embryonal connective tissue gradually becomes fibrous and the liver-cells are converted into cancer-cells. [Siegenbeck van Heukelom[2] holds that this form of carcinoma arises from a hyperplasia of the hepatic epithelium independent of the cirrhosis, although the latter may

[1] Univ. Med. Mag., Aug., 1895.

[2] Ziegler's Beiträge, Bd. xvi. H. 3.

favor the development of the carcinoma. Notthafft[1] looks upon the cirrhosis as secondary and as a defence of the organism against the cancer. While we agree with Notthafft's views as to the origin of carcinoma (see page 706), we must accord to the cirrhosis more than such a subordinate position, and believe that the view of Hanot and Gilbert, that the same irritant acts simultaneously upon the epithelium and the connective tissue, is the correct one.]

Carcinoma of Pancreas.—Miller[2] reports a case of primary carcinoma of the head of the pancreas, without metastasis to any organ. The patient was 53 years old, and had presented all the symptoms of pyloric stenosis, but, HCl being present and lactic acid absent, gastric carcinoma was excluded. At the autopsy an hour-glass contraction of the stomach was found. Sugar was not present in the urine in the few analyses made; the stools were not examined microscopically for fat.

Sarcoma of Pancreas.—Blind[3] presented to the Société anatomique a specimen of sarcoma of the tail of the pancreas, with metastasis to the liver and peritoneum, taken from a man aged 74 years.

Pathogenesis of Abdominal Fat-necrosis.—Ponfick[4] found a bacillus in almost pure culture. The bacillus was obtained from a hemorrhagic focus in the neighborhood of the second lumbar vertebra, and morphologically and culturally resembled the typhoid-bacillus, but gave the indol-reaction; from the colon-bacillus it differed in the mode of growth and in the smoothness, slimy character, and thickness of the colonies. The author believes that the organism probably belongs to the group of colon-bacilli. It is pathogenic for white mice and rabbits; guinea-pigs and dogs resist its action. In the susceptible animals it produces a local inflammation and, if the dose is sufficient, a general infection; necrotic changes were also noted, though only of microscopic character. The author is not prepared as yet to assert that the bacillus is the cause of fat-necrosis.

Gonorrheal Peritonitis.—Bröse, at a meeting of the Berliner medicinische Gesellschaft, Mar. 11, 1896, reported 2 cases of diffuse gonorrheal peritonitis. The disease came on after acute gonorrheal infection. The gonococcus could not be demonstrated.

THE RESPIRATORY TRACT.

The Etiology of Ozena.—Abel,[5] from a bacteriologic study of a large number of cases (100) of ozena, concludes that it is an infectious disease caused by a specific microorganism, termed by him *Bacillus mucosus ozænæ*. It is a rod-shaped organism, 1.25 μ wide and variable in length; it occurs in pairs or chains, has somewhat rounded ends, and is as a rule surrounded by a capsule. The bacteria are readily stained with the anilin dyes, but not by Gram's method. On gelatin-plates they produce, in 48 hours, small, microscopic, brownish-black or grayish-green, finely-striated colonies, which on the surface are ele-

[1] Deutsch. Arch. f. klin. Med., Aug. 29, 1895. [2] Med. Rec., N. Y., Aug. 31, 1895.
[3] Centralbl. f. Allg. Path. u. Pathol. Anat., Aug. 21, 1895.
[4] Berl. klin. Woch., April 27, 1896. [5] Zeit. f. Hyg. u. Infektionskrank., 1896, i. p. 89.

vated. In from 2 to 4 days they are visible with the naked eye. The gelatin is not liquefied. They grow readily on agar at body-temperature, producing, as in the other media, a slimy growth, whence the name; on potato they produce a luxuriant creamy growth; bouillon and peptone-water are rendered turbid. Milk is not altered; in it the bacterium often forms a capsule. The bacillus is nonmotile, contains no spores, and has no flagella. The capsule-formation disappears after one or two generations, except in milk-cultures. Gas-production is slight or entirely absent. The bacillus is pathogenic for white mice, the bacteria being found in all of the organs. Rats and guinea-pigs proved refractory to subcutaneous inoculation; a local process developed after infection into the abdominal cavity or lung. Rabbits are immune. The bacillus mucosus ozænæ closely resembles Friedländer's bacillus, and, while probably distinct, belongs to the same group of pneumobacilli. The bacillus causes small foci of a peculiar secretion which quickly dries to crusts; the accessory cavities of the nose, the middle ear, larynx, and trachea may be affected as well as the nose. In one case the disease was experimentally inoculated into a healthy nose. The fetid odor is not due to the ozena-bacillus, but to other bacteria which find a favorable nidus in the areas attacked by the former.

Oestreich [1] reports 3 new cases of primary **carcinoma of the trachea.**

Bacteriology of Whooping-cough.—Cohn and Neumann [2] found most frequently cocci, among them regular diplococci usually not arranged in chains. Rod-shaped forms were but rarely observed. In cultures streptococci, the nearly constant attendants of respiratory diseases, were almost invariably found; also, but not constantly, diplococci; therefore, it is not possible to look upon these as causative. The bacillus of Afanasiew and the diplococcus of Ritter were seen so seldom that they too cannot be considered the etiologic factors. Kurloff,[3] subjecting the sputum to microscopic examination in the fresh state, found two bodies which he considers parasitic: (*a*) a unicellular ciliated body varying in size from half the diameter of a red corpuscle to a diameter greater than that of the largest white corpuscle; (*b*) a peculiar ameba. The latter is the more important, and is considered by the author the cause of pertussis.

Membranous Bronchitis.—Magniaux [4] reports a case of fibrinous bronchitis in a boy of $11\frac{1}{2}$ years. The formation of the membrane was due to an inflammatory process, the cause being the streptobacillus of Friedländer.

Atypical Croupous Pneumonia, especially Streptococcus-pneumonia.—Harbitz [5] describes 5 cases of atypical, nonpneumococcic pneumonia. The disease began insidiously, with signs of grave general infection, marked cerebral symptoms, and irregular, pyemic fever; all the cases terminated in

[1] Zeit. f. klin. Med., 1895, xxviii. p. 383.

[2] Arch. f. Kinderheilk., xvii.; ref. in Centralbl. f. Bakt. und Parasit., Nov. 15, 1895.

[3] Centralbl. f. Bakt., Parasiten. u. Infektionskrank., Apr. 25, 1896.

[4] Récherches sur la Bronchite membraneuse primitive. Société d'éditions scientifiques, Paris, 1895.

[5] Festskrift i anledning af Prof. Hjalmar Heibergs 25 aars jubilaeum, Christiania, p. 249; ref. in Centralbl. f. Bakt. und Parasit., Nov. 15, 1895, p. 593.

death. The lungs presented more or less well-marked lobar infiltrations, generally soft and without granular surface of section; in other cases, broncho-pneumonic foci in the one lung, with lobar infiltration of the other. The appearance was very variable, and suggested phlegmonous or erysipelatous processes. In 4 cases only streptococcus pyogenes was found; in 1 case, with notably atypical course, complicated with otitis media, the lungs contained staphylococcus, B. coli communis, and B. pyocyaneus, but no streptococci or pneumococci. The pus from the ear contained staphylococcus and B. pyocyaneus.

The Arthropathies of Croupous Pneumonia.—Vogelius[1] found the diplococcus of Fränkel in the pus of the joint-lesions that had developed in 2 cases of croupous pneumonia. This makes a total of 11 cases in which bacteriologic examination showed the presence of this organism in the arthritic lesions complicating croupous pneumonia.

Primary Actinomycosis of Lung.—Heusser[2] describes a case of primary actinomycosis of the lung in a woman of 50 years, which presented itself with the symptoms of a tuberculosis with cavity-formation, secondary to an exudative pleurisy.

Aspergillosis of Lung.—Renon[3] reports the occurrence of aspergillar tuberculosis in husband and wife, who were engaged in carding hair obtained from rag-pickers.

Etiology and Pathologic Anatomy of Lobular Pneumonia, especially of Aspiration-pneumonia.—Kreibich,[4] after reviewing the literature of the subject, propounds the following questions: (1) What bacteria are found in lobular pneumonias, especially in those due to aspiration? (2) Which of those found are concerned in the production of the inflammation? (3) Is the character of the exudate dependent on the species of bacteria found? He examined 27 lobular pneumonias (20 due to aspiration) and 1 lobar pneumonia. The diplococcus pneumoniæ was found in 23 cases—11 times alone, 5 times with the bacillus coli, 4 times with the staphylococcus aureus, once each with the streptococcus, bacillus pneumoniæ, and an unknown bacillus. The streptococcus was found twice in pure culture. The bacillus coli was found 7 times; in pure culture in the case of lobar pneumonia. In reply to the second question the author states that aspiration-pneumonia is usually caused by the diplococcus of pneumonia, although the bacillus coli is capable of producing lobar pneumonia and of taking part in the production of lobular pneumonia. The colon-pneumonias are the result of hematogenous infection from the intestinal or urogenital tract. In regard to the third question the answer is not definite. The author divides his cases into those terminating in suppuration, in gangrene, and in induration. The termination seems to a large extent to depend on associated bacteria.

Empyema due to Friedländer's Capsule-bacillus.—Wolf[5] reports

[1] Arch. de Méd. expér. et d'Anat. path., Mar., 1896.
[2] Berl. klin. Woch., 1895, No. 47.
[3] Jour. des Conn. méd., 1895, No. 44.
[4] Monograph, Wilhelm Braumüller, Vienna, 1896.
[5] Berl. klin. Woch., Mar. 23, 1896.

a case of right-sided pneumonia with limited pleurisy, followed, after an atypical course, by interlobar empyema rupturing into the lung. The cause was Friedländer's diplobacillus.

Empyema due to Proteus Vulgaris.—Charrin[1] in an empyema occurring in a puerperal woman found pure cultures of proteus vulgaris.

Etiology of Pleuritis.—Thue[2] has studied bacteriologically 35 serous pleurisies and 23 empyemas. Of the first, 1 was tuberculous, 1 cancerous, a third developed during an attack of acute articular rheumatism; the others presented the symptoms of simple pleuritis without a lung affection. A subsequent examination showed that 60% of all the patients died within a relatively short time of tuberculosis. From the fluid of the pleurisies the author made cultures and inoculated animals, and made cover-glass preparations from the sediment. Examination was negative in 18 out of 30 cases; in the remaining 12 the tubercle-bacillus was found once, the streptococcus once, cocci of unknown species twice, staphylococcus pyogenes aureus and albus once, staphylococcus pyogenes albus alone 3 times. In the 23 empyemas the pneumococcus was found 14 times, streptococcus twice, streptococcus and saprophytic organisms twice, streptococcus and staphylococcus once, staphylococcus albus once, tubercle-bacillus once; no bacteria in 2 cases (pyemic and tuberculous). [These are interesting studies, particularly with regard to empyema, showing the great preponderance of the pneumococcus over the ordinary pyogenic organisms. The pneumococcus was also found in 3 cases of serous pleurisy which, however, soon became purulent.]

Pleurisy in the Course of Gonorrhea.—Bertrand[3] states that the pleurisy following gonorrhea may be dry or effusive, is usually mild, and short in duration. Gonococci have been found in the effusion by Chaiso, Isnardi, and the author, and on cultivation by Mazza.

THE URINARY TRACT.

Albumosuria.—Harris,[4] after stating the characteristic reactions of albumose as given by Munk, describes his method of qualitatively determining the presence of albumose in small quantities. He rejects the term peptonuria, since the substance upon which this name is based is really an albumose. The urine was examined in a great variety of states. The diagnostic value of albumosuria, as far as suppuration is concerned, is stated as follows: Given a patient with a probable circumscribed inflammatory condition, in which the infective diseases can be excluded, the presence of albumose in the urine is quite positive evidence that the condition is inflammatory, and that suppuration has taken place.

The final conclusions are: 1. True peptone being very rarely, if ever, found

[1] Mercredi méd., June 19, 1895.

[2] Norsk Magaz. f. Lægevidensk., 1895, No. 3, Supplement; ref. in Centralbl. f. Bakt. u. Parasit., Oct. 26, 1895.

[3] Thèse de Paris, No. 188, Mar., 1896; ref. in Gaz. Hebdom., Apr. 12, 1896.

[4] Am. Jour. Med. Sci., May, 1896.

in the urine, the term peptonuria should be replaced by the term albumosuria. 2. The albumoses are produced by the digestive or peptonizing action of microbes on the albumins of the body. 3. This digestive action is one common to all living organisms. 4. The albumoses are produced in quantities much in excess of what are appropriated by the microbes for their growth and development. 5. The albumoses being readily diffusible, the excess in production is quickly absorbed by the blood, from which, being toxic and acting as foreign bodies, they are eliminated by the kidneys and appear in the urine. 6. Albumosuria may be present in any condition or disease due to the action of microorganisms within the body, and is thus simply indicative of an infective state.

Krehl and Matthes[1] found an **albumose in the urine** of febrile patients which produced fever when injected into guinea-pigs.

Relation of Uric-acid Elimination to Leukocytosis.—Kühnau[2] found that an increase in the number of leukocytes (as in leukemia, croupous pneumonia, sepsis, malignant neoplasms) was always followed by an increased elimination of uric acid. The increase was not dependent on the fever alone.

Rumpf[3] found an increase in the excretion of **ammonia in the urine of cases** suffering from croupous pneumonia, typhoid fever, influenza, rheumatic arthritis, and bronchitis with arthritis. He believes that the increase depends, in general, on the augmented metabolism.

Carcinoma of Ureter.—Hektoen[4] reports a case of primary carcinoma of the ureter in a woman of 50 years.

The Action of Poisons on the Epithelial Cells of the Convoluted Tubules of the Kidney.—Vandervelde[5] has examined the kidney in Asiatic cholera, cholera nostras, acute tuberculosis, and diphtheria, and in various forms of poisoning (chromic acid, lead) experimentally produced in animals, and has reviewed the observations of others on pneumonia, influenza, poisoning by zinc oxid, phosphorus, and mercuric chlorid, and finds that in all of these a toxic substance brought to the kidney by the blood exercises a harmful influence on the cells of the convoluted tubules. The lesions produced are cloudy swelling, fatty degeneration, and coagulation-necrosis. The protoplasm is chiefly affected; the nuclear changes appear much later.

Changes in the Kidneys of Atrophic Infants.—Simmonds[6] in 60 autopsies on infants that had died of pedatrophy, found lesions of the renal epithelium of greater or less degree in all cases, varying from mild cloudy swelling to fatty degeneration, with small exudates into the capsule of Bowman. In many cases the tubules contained casts. Regarding the cause of these renal changes, the author excludes gastrointestinal catarrh, since no case presenting such a condition is included in the series of 60 cases; the influence of drugs, of rickets, of catarrhal pneumonia is also excluded, and no other

[1] Deutsch. Arch. f. klin. Med., 1895, 54, 4 and 5.

[2] Zeit. f. klin. Med., xxviii. p. 534, 1895. [3] Virch. Arch., Jan., 1896, Bd. cxliii.

[4] Jour. Am. Med. Assoc., June 6, 1896.

[5] Action des Poisons sur les Cellules épithéliales des Canalicules contournés, Bruxelles, 1894. [6] Deutsch. Arch. f. klin. Med., Mar., 1896.

PLATE 9.

Fig. 1.



Fig. 2.

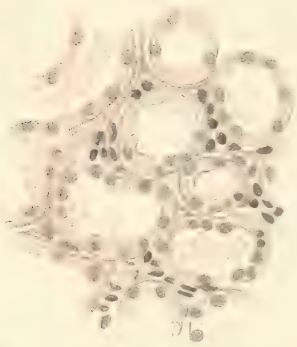


Fig. 3.

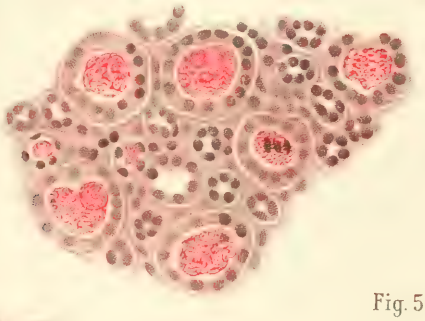


Fig. 4.

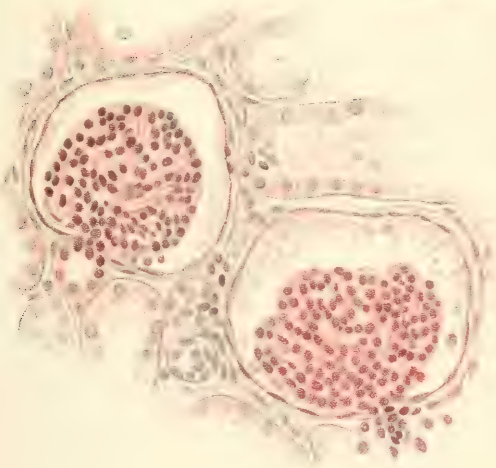


Fig. 5.

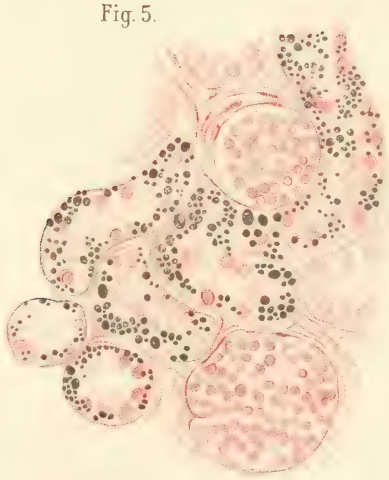


FIG. 1.—Necrosis of epithelium of uriniferous tubules with loss of nuclei. FIG. 2.—Breaking down of the parts of the epithelium nearest the lumen of the tubules. The lumen is filled with granular and hyaline masses. FIG. 3.—Cross-section of tubules with numerous granular casts FIG. 4.—Granular exudate into Bowman's capsule taking a crescentic shape; plasmolytic changes in the epithelium of the tubules. FIG. 5.—Fatty degeneration of the epithelium of the tubules (osmic-acid preparation); thickening of capsule of one glomerulus. (Deutsch. Arch. f. klin. Med., Bd. lvi.)

complication remains except middle-ear disease. This was noted in 28 out of the 60 cases; however, in only 29 was the condition looked for. In 5 only out of another series of 133 infants on which autopsies were made was otitis media absent. Cultures of the contents of the middle ear, whether these were purulent or not, gave immense numbers of bacteria, among them Fränkel's diplococcus, Friedländer's pneumobacillus, the streptococcus pyogenes, the staphylococcus, the bacillus pyocyaneus, and others. Cultures from the kidneys (5 positive cases) showed the bacillus pyocyaneus 4 times. The author agrees with Kossel that this organism is far more virulent for infants than for adults. In cases where organisms could not be demonstrated in the kidney, the lesions may have been produced by toxins. The author's conclusions are that the renal lesions of atrophic infants in the majority of cases depend on middle-ear disease, and that this, with the consecutive degeneration of the kidneys, is one of the most frequent causes of death of such infants. (See Plate 9.)

The Etiology of Suppurative Nephritis.—Wunscheim[1] publishes an exhaustive study on this subject made in Chiari's laboratory, of which we give the conclusions: 1. Suppurative pyelonephritis in the great majority of instances is caused by the bacillus coli communis, in the minority by proteus vulgaris or the common pyogenic cocci; 2. In those cases in which the ordinary pyogenic organisms are the cause, a consecutive pyemia is usually developed; 3. The pyelonephritis produced by the staphylococcus and streptococcus differs not only by reason of the usually associated pyemia, but also microscopically by a more marked destruction of tissue and the absence of the local hyperplasia, from that excited by the bacillus coli communis; 4. It is not probable that the typical picture of ascending pyelonephritis can be produced by "descension"—*i. e.* by elimination of microorganisms that have entered the blood-stream from the bladder.

On Kidney-tumors derived from Suprarenal "Rests."—McWeeney[2] describes 2 renal tumors which on microscopic examination were found to present the features of suprarenal tissue. The presence of large fat-globules in many of the cells, coupled with the absence of indication of degenerative change—this being a normal condition in the adult suprarenal—strengthened the diagnosis.

The author discusses the nature of these growths—are they sarcomata, carcinomata, adenomata, teratomata? The following characters seem to point to carcinoma: 1. The cells are obviously epithelial; 2. The stroma does not penetrate between them, but divides the cell-groups into elongated or circular alveoli. However, considering the mesoblastic origin of the suprarenal—from the celomic epithelium—the tumors might, according to the views of Waldeyer and Thiersch, be considered sarcomata. For the present the author prefers to call them kidney-tumors derived from suprarenal "rests," instead of carcinomata or sarcomata. Lubarsch[3] collected 30 cases, which are summarized as follows: *Sex.*—Out of 29 cases cited by Lubarsch, 20 were those of males.

[1] Zeit. f. Heilk., xv. p. 287. [2] Brit. Med. Jour., Feb. 8, 1896.
[3] Virch. Arch., Bd. cxxxv. p. 104.

Both of the author's patients were females. *Age.*—Out of 29 cases, 21 were between 40 and 79; 8 between $2\frac{1}{2}$ and 39. One of the author's cases was 53, the other 38. *Side.*—The right kidney was affected 12 times, the left 11. In both of the author's cases the left was the seat of the disease. *Duration.*—This is usually long, 2, 6, and even 10 years elapsing from the time of appearance of the first clinical symptoms. Askanazy's patient felt the tumor when very young; it disappeared for a time, and returned fatally when he was 53. The tumors grow slowly at first, and then seem suddenly to produce cachexia and prove fatal. *State of Urine.*—This seldom yields positive evidence of the existence of the tumor. It did so, however, in Grawitz' first case, though the indications were susceptible of misinterpretation. *Metastases.*—These were found 20 times out of 29, a fact which proves the malignant tendency of these suprarenal neoplasms. One of the author's cases recovered; on the other necropsy was refused. [Regarding the nomenclature of tumors derived from mesoblastic epithelium, it appears to us that Waldeyer's and Thiersch's views cannot be strictly followed. If the tumor presents the histologic features of a carcinoma, it should be called so. After all, the mesoblast is a derivative of the hypoblast, and forms epithelial-like cells—as, *e. g.*, in the kidneys—that bear more resemblance to hypoblastic epithelium than they do to mesoblastic cells, as represented by the connective and lymphoid structures. We cannot see why mesoblastic epithelium, using the term epithelium in the morphologic sense, cannot form adenomata and carcinomata just as any other secreting epithelium. Every one accepts the occurrence of carcinoma of the uterus, and yet this organ is mesoblastic in origin.]

THE DUCTLESS GLANDS.

Graves' Disease.—Farner[1] has examined the goiter in 10 cases of Graves' disease. Of these 8 were diffuse and 2 nodular goiters. The diffuse were divisible into three groups. In the first the alveoli were large and filled with colloid material, and were distinguished from those of normal thyroids only by the presence of colloid in the lymph- and blood-vessels and between the fibers of the stroma. In the second group the follicles were smaller, and usually only partly filled with colloid, which was not so shining as in the first group. The septa contained less colloid in the connective tissue and lymphatics, but just as much in the veins. The epithelium showed a tendency to form papillæ. The thyroids of the third group contained many solid cell-masses, of which some were follicles filled with desquamated epithelium, others lobules and groups of lobules made up of narrow cell-strands. In the nodular goiter some lobules attained a diameter of $\frac{1}{2}$ to 3 cm.; others were compressed to a diameter of $\frac{1}{10}$ mm. Many nodules were made up of solid cell-strands, containing in numerous places balls of colloid matter. Other nodules consisted of small solid cell-masses; still others resembled the ordinary colloid goiter. The first group of diffuse hyperplastic goiters showed hypersecretion; the second, an increase of function associated with an alteration in

[1] Virch. Arch., Mar., 1896, Bd. cxliii.

the secreted matter, allowing more ready absorption; while in the third group the increased activity of the gland manifested itself partly in hypersecretion, partly in the formation of solid cell-masses.

Lubarsch[1] at the Congress of German Physicians and Naturalists at Lübeck described the changes found by him in the thyroid gland in cases of Graves' disease. Glandular follicles were rarely found, but chiefly cystically dilated spaces lined by epithelial cells, with more or less marked papillary formation; the spaces contained little or no colloid, but a fluid of mucoid nature. Regarding the pathogenesis of Graves' disease, Lubarsch is of opinion that the thyroid changes cannot be considered secondary to primary alterations in the sympathetic or medulla oblongata; on the other hand, it is not possible to explain the whole symptom-complex by the thyroid changes. Hypersecretion of colloid cannot be the cause of the disease, since in the enlarged gland in morbus Basedowii almost no colloid is secreted. Probably we are dealing with a common factor which produces both the changes in the nervous system and those in the thyroid gland.

Diplococcus-strumitis.—Heddaeus[2] reports a case of acute strumitis produced by the diplococcus of Fränkel-Weichselbaum, and followed by a secondary metastatic croupous pneumonia. [By strumitis is understood an inflammation of a goitrous thyroid gland. It seems that inflammation of a normal thyroid is rare; we have seen a case in which malarial infection was possibly the causative agent.]

The Importance of the Spleen in Infectious Diseases.—This subject has been investigated by a number of scientists, whose conclusions, however, are not in accord. Metschnikoff and his school hold that the cells of the Malpighian bodies act as phagocytes and destroy bacteria. Nikiforow denies this relation of the spleen to immunity, at least as far as relapsing fever is concerned, upon which Metschnikoff based his studies. Tiktin comes to similar conclusions after experiments on monkeys. Tizzoni and Cattani in their recent studies found no noteworthy difference between splenectomized and nonsplenectomized rabbits, although earlier experiments had led them to form an opposite opinion. Bardach (tetanus, Schweinerothlauf, and ricin) and Kanthack (bacillus pyocyaneus) could not demonstrate any influence of the spleen. Montuori found that the blood of splenectomized rabbits for a time loses its bactericidal properties, but that these subsequently return. Hence he considers the spleen as one source of the bactericidal element of the blood. Kurlow, using rabbits, found that the removal of bacteria from the blood was not a specific function of the spleen, and believes that it is brought about by the physical peculiarities in structure of all organs possessing a fine and abundant capillary network. The subject has now been studied, with careful attention to the flaws of previous experiments, by Melkinow-Raswedenkow,[3] who also used rabbits in his investigations. His conclusion is that splenectomy is a weakening factor in the immunization of animals, but the spleen itself does

[1] Centralbl. f. Allg. Path. u. Pathol. Anat., Oct. 15, 1895.

[2] Münch. med. Woch., May 26, 1896. [3] Zeit. f. Hyg. u. Infectionskrank., 1896, xxi. 3.

not play the role in the battle against the microorganisms assigned to it by the adherents of the phagocytic theory.

Experimental Addison's Disease in the Sewer-rat.—Boinet[1] removed both suprarenal capsules in 109 rats, ligated them in 20, and used various irritants in another series to produce inflammatory changes in them. In half of these animals a black pigment was found in considerable quantity in the blood, similar to that found in the tissues of 2 cases of Addison's disease; in one-fourth of the cases it existed in less quantity; and in the remainder it was not found. The subcutaneous cellular tissues, the mucous and serous membranes, and the lymphatic glands were considerably infiltrated with pigment in certain rats examined some months after the operation; and this infiltration was most pronounced in 3 rats that had been subjected to the exhaustion of constantly-repeated electric shocks. The rats sometimes exhibited symptoms of asthenia and paresis. In one case the gland exhibited the typical cheesy degenerative change of Addison's disease. The extract of the muscles of the Addisonian rats was very poisonous, causing death in a normal rat in 3 days, and a much smaller quantity killing a rat, the adrenals of which had been removed 4 days previously, in a few hours. This toxicity is increased by producing a state of exhaustion in the animals.

TUMORS.

Israel[2] found **two primary cancers in the same individual**—a cylindric carcinoma of the gall-bladder and a "cancroid" of the pancreas. According to Schimmelbusch, there are 3 forms of primary multiple cancer: 1. Multiple carcinoma in the same system, especially in the skin; 2. The supposed primary cancers of symmetric organs; 3. The rare occurrence of primary cancers in different organs, as in this case. [In the absence of illustrations and minute description we cannot state the exact nature of the pancreatic "cancroid."]

Heller[3] describes **bile-forming cancer-nodules in the lung** secondary to carcinoma of the liver.

Intrathoracic Tumors.—Pepper and Stengel,[4] from a careful examination of the literature and their own experience in 9 cases, are led to the conclusion that the majority of intrathoracic tumors are sarcomata, and that the most frequent point of origin is the anterior mediastinum, in particular the remnant of the thymus gland.

Endothelioma.—Hansemann[5] maintains that the term endothelioma comprises, morphologically, more than a single class of tumors. One group comprises tumors having a distinct alveolar architecture, which were formerly described as carcinomata; another group are sarcomata; a third consists of combinations of the previous two; a fourth comprises various tumors, all charac-

[1] Gaz. des Hôp., Feb. 13, 1896; abst. in Internat. Med. Mag., Apr. 1896.
[2] Rep. of Berl. Med. Soc., in Berl. klin. Woch., Jan. 13, 1896.
[3] Centralbl. f. Allg. Path. u. Pathol. Anat., Oct. 15, 1896.
[4] Internat. Med. Mag., vol. iv., Nov., 1895. [5] Deutsch. med. Woch., 1896, No. 4.

terized by prominent changes in the stroma; a fifth group represents tumors resembling the adenomata. The clinical course of all of these is variable: the second and third are malignant; the first are like true carcinomas; those of the fourth group are generally benign, but at times present local malignancy, and the adenomatous forms are similar. In conclusion Hansemann proposes the following classification: 1. Carcinoma endotheliale; 2. Sarcoma endotheliale; 3. Carcinoma sarcomatodes endotheliale; 4. Endothelial tumors with specific development of the stroma (cylindroma or siphonoma; myxoma; chondroma; scirrhus; mixed forms approaching sarcoma or carcinoma); 5. Adenoma endotheliale. [In the whole chapter of tumors the group termed endotheliomata stands in the greatest need of clarification. While the foregoing paper does not completely elucidate the question, we think Hansemann has taken a step in the right direction. In many respects endothelium resembles epithelium, and it would be better, it appears to us, for the purposes of the pathologist to consider it more closely related to epithelial than to connective tissue. Adopting this view, we can see how it—*i. e.* endothelium—could produce carcinomatous growths, and even adenomas, although we have not seen anything like that. This would explain then the reported occurrence of primary cancer of the pleura and the peritoneum.]

Dermoid Cysts and Teratomata.—From an elaborate monographic article on this subject by Wilms[1] we abstract the following conclusions: 1. The dermoid cysts of the head, thorax, and a part of the cysts of the retroperitoneal and retrorectal tissues are produced by misplacement of tissue in invagination of glandular structure or coalescence of fetal clefts; 2. A part of the teratomata at the base of the skull and in the abdominal cavity are to be considered as double monsters and as analogues to the fetal enclosures; 3. Excepting those originating in the ovary, all dermoid cysts are either pure dermal cysts or contain in addition such tissues as occur in the neighborhood; 4. The ovarian cysts must be separated, both in view of their structure and origin, from the other dermoid cysts; 5. The dermoid cysts of the ovary originate from a three-layered germinal mass which strives to develop in accordance with the development of the human fetus, and permits us to recognize, even in the arrangement and position of the organs, a similarity to the latter; 6. In consequence of the hindrance to growth produced by mechanic pressure the tissues and parts first differentiated reach a fuller development and choke the others. This accounts for the prevalence of the ectoderm and the cephalic region; 7. Apart from this law of earlier differentiation there is in the development of certain organs another important factor—the difference in the energy of growth of various species of cells; 8. Both in the structure and form of the individual tissues and organs the malformation develops, in case mechanic interference does not disturb, in complete accordance with normal conditions; 9. The circulation of blood in the ovarial parasite is regulated by the maternal organism, but the malformation may in part supply its vascular system, and may participate, under certain conditions, in the formation of the

[1] Deutsch. Arch. f. klin. Med., Mar. 13, 1895.

blood; 10. Since with the circulation the nutrition and the elimination of waste-products are controlled by the mother, we have probably accounted for the constant absence of certain organs, as liver and kidney; 11. The dermoid cysts of the ovary are, therefore, parasitic fetuses, which are best classed in a separate group under the name of *rudimentary ovarial parasites.*

Amyloid Degeneration in Tumors.—Lubarsch[1] describes the occurrence of amyloid degeneration in certain tumors, generally endothelial growths.

Etiology of Tumors; Protozoa and Blastomycetes.—Ribbert[2] brings further evidence in support of his theory of the origin of carcinoma. According to him, the primary lesion of cancer is an active, inflammatory proliferation of the subepithelial connective tissue. The consequent lengthening of the papillæ is followed by an overgrowth of the epithelium covering them. This is, however, unimportant and secondary. Connective tissue now grows into the lengthened glands, and gradually parts of them are separated and isolated. Now begins the characteristic feature of cancer-formation: freed from the restraining power the organism exerts by means of mechanic and biologic influences, and by which the growth of cells is kept in check, the groups of isolated cells grow with an activity that the other tissues cannot withstand, pressing into the spaces of the connective tissue, and including some of its fibers and cells to form the alveoli.

A separation of tissue-elements from their proper relation, either in intrauterine or extrauterine life, Ribbert believes to be the cause of all tumors. In support of this theory he cites the following: 1. The site of an incipient cancer is always raised above the surrounding surface; this is caused by a subepithelial connective tissue rich in cells; 2. While in this way the papillæ may be lengthened to two or three times the normal size, requiring a local hypertrophy of the epithelium to cover them, it can be shown that the deepest points of the glands do not project below their normal position. The epithelial cells appear stretched and the arrangement of the vessels of the papillæ is normal; 3. That at this point the epithelium should suddenly take on an active growth, overcoming the resistance of the connective tissue, and growing in direction opposite to the normal, is unnatural and requires a special explanation. It is more in accordance with biologic principles to assume that the previous connective-tissue growth continues, and, as in other conditions we find phagocytes and lymphocytes in epithelium, so here the connective tissue grows in between the cells.

Notthaffi,[3] in a well-written article, attacks Ribbert's theory of **the origin of carcinoma** set forth above, on the basis of a careful study of 3 incipient carcinomata. Nothing was seen indicating an advance of the connective tissue into the epithelium; on the contrary, the impression was that the tumor pushed the closed layers of the connective tissue in front of it and compressed them. In regard to Ribbert's view that many carcinomata originate on the base of tuberculous lesions through which the subepithelial hyperplasia is produced,

[1] Centralbl. f. Allg. Path. und Pathol. Anat., Oct. 15, 1895.

[2] Virch. Arch., cxli. p. 153, July, 1895. [3] Deutsch. Arch. f. klin. Med., Aug. 29, 1895.

the author holds that tuberculosis may favor the later development of carcinoma, perhaps by creating a predisposition, but there is no proof of the separation of epithelial by connective-tissue cells in the sense of Ribbert. The author finally concludes with the statement that carcinoma can arise without previous changes in the subepithelial or submucous tissue, though it may also develop secondarily to a primary connective-tissue hyperplasia.

Kahane[1] in a lengthy theoretic paper discusses the origin of carcinoma from the biologic standpoint, which, he believes, is the only one through which a correct understanding of the subject can be attained. On examining living tumor-particles he found both in carcinoma and sarcoma the blastomyces described by Busse and by Sanfelice, as also motile sporozoa. The blood of persons suffering from malignant growths presents marked degenerative phenomena, and also "paracytic" elements probably identical with the motile sporozoa of the tumor. The cells of the tumor are seen to take up red and white corpuscles in large numbers (*cytophagy*). The chief characteristics of tumor-cells are—(1) *lymphotropy*, and (2) regenerative tension (*regeneratiy Spannung*). Lymphotropy is a peculiar attractive energy which the cells possess toward the lymph, which explains softness of tumors according to their malignancy; the consistency does not depend on the blood, which, on account of the imperfect vascularization, is not sufficient to nourish the cells; the latter receive their nutriment from the lymph. The increased metabolism thereby rendered possible produces a greater proliferation of the cells. As regenerative tension Kahane designates the tendency of cells to regenerate rapidly. If a chronic irritation increases this regenerative tendency within the cells, the transition to tumor-growth is given; perhaps a slight trauma or a displacement of the epithelium is sufficient. [It cannot be said that these considerations materially serve to clear the obscure question of the pathogenesis of malignant tumors. Kahane, moreover, does not state what part the parasite plays in the matter.]

The Parasitism of Carcinoma.—Schwarz[2] presents us with a careful critical discussion of this question, based on a thorough knowledge of the literature and a personal study of a large number of carcinomata. After showing that most of the bodies designated as carcinoma-parasites are really products of degeneration, he states that the bodies described by Steinhaus, Siegenbeck, Stroebe, Thoma, Sjöbring, and especially by Ruffer, Walker, and Foa, cannot be included in the same class and must be studied apart. His own researches revealed similar cell-enclosures, which he divides into three groups: the plasmoid, the cytoid, and the cystoid. Using a stain composed of gentian-violet and safranin, the enclosures of the first group appear as minute, pale-blue, oval or round particles. They are situated in a vacuole of the cell. The cytoid enclosures have a nucleus and a nucleolus, and are situated eccentrically in the cells. The cystoid enclosures are the most complicated, and consist of several bodies united together to form one enclosure.

[1] Centralbl. f. Allg. Path. u. Pathol. Anat., vi. 17, 1895.

[2] Beiträge z. klin. Med. u. Chir., 1895, H. 12.

The enclosures described were found only in carcinomas of glandular origin, not in squamous epithelioma. They were also present in the metastatic growths. The author then proceeds to sketch a cycle of development of the parasite, consisting of four stages. But after minutely describing these stages and comparing certain phases to gregarines, the author, by a *reductio ad absurdum*, which comes like an unexpected dénouement in a novel, points out that what he describes are really not stages in the life-history of a protozoan, but that a part of the enclosures are altered leukocytes. This breaks the chain of evidence, and the whole hypothesis falls. Some of the plasmoid enclosures are degenerative products of Altmann's granules; the cytoid and cystoid formations are probably enclosed cancer-cells.

A Protozoan in Lipoma.—Vedeler[1] believes that the origin and growth of lipoma and the development of the enclosing capsule can only be explained on the assumption of the existence of some irritant. This he claims to have found. The piece of tumor was fixed in 5% sublimate solution, the fat extracted with ether, the tissue stained with hematoxylin and eosin, and imbedded in paraffin. Two classes of bodies are described: an opaque one, up to 16 μ in diameter, and a brighter one, with clearly defined capsule, a vesicular nucleus, and granular protoplasm. They are supposed to be stages in the life of the protozoan of lipoma. The bodies are found nearest the capsule. [It is needless to say that we cannot follow the author in conclusions based on such a limited investigation.]

The Blastomycetes.—Kahane,[2] who was one of the first to describe the presence of blastomycetes in malignant tumors, in his last communication states that the blastomyces which he has constantly found in malignant growths is nothing more than the common yeast, Saccharomyces cerevisiæ, and he defines, tentatively, epithelioma (on which his statistics have chiefly been made) as the expression of a peculiar symbiosis of epithelial cells, leukocytes, and saccharomycetes.

Roncali[3] studied 5 sarcomata, in all of which he found blastomycetes that resembled each other very much and were similar to those described by Sanfelice, and by the author as occurring in adenocarcinoma of the ovary. They take the specific stain of blastomycetes, and resist the action of acids and alkalies like those found in the adenocarcinomas of the ovary. The parasites may be found within and without the cells, exceptionally also in the nucleus; they multiply by budding, and may in the early stages—*i. e.* when without membrane—possess an abundant chromatic protoplasm, or in the adult stage—*i. e.* with membrane—may have but little chromatic protoplasm or a protoplasm that has entirely lost the power of staining with the anilin dyes.

Sanfelice[4] has made inoculations into guinea-pigs of a yeast which he terms Saccharomyces ellipsoideus neoformans. Animals that had received an

[1] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 28, 1896.
[2] Centralbl. f. Allg. Path. und Pathol. Anat., June 15, 1896.
[3] Centralbl. f. Bakt. und Parasit., Oct. 26, 1895.
[4] Zeit. f. Hyg. und Infektionskrank., 1896, i. p. 32.

inoculation into the subcutaneous tissue died on an average in 30 days. The inoculation was in a few days followed by a local swelling, which might or might not break down. The lymphatic glands of the groin and axilla also became enlarged. At the autopsy the tumor in the subcutaneous tissue was soft, not firmly adherent to the skin, and presented an appearance like that of the flesh of fish; the lymphatic glands had the same characters. The spleen was enlarged and was studded with elevated whitish nodules; the liver was but slightly increased in size, and rarely showed the whitish spots seen in the spleen. In the kidneys the nodules were more common than in the liver. The intestinal follicles and lymphatic glands were enlarged. The lungs were also enlarged and contained whitish areas. Brain, heart, and adrenals showed no macroscopic change. Guinea-pigs that were inoculated into the testicle died in the course of about 25 days. Testis and epididymis were enlarged and contained fish-flesh-like masses. Inoculation into the liver was followed by the development of tumors, single or multiple, in that organ. The changes were most marked after intraabdominal inoculations. A severe peritonitis, which the author terms a neoplastic one, was always noted. The viscera also presented nodules as previously described. The nodules contained enormous masses of blastomycetes. Many leukocytes containing blastomycetes were seen. Histologically the tumors consist of a network of young connective tissue in the meshes of which a variable number of cells resembling lymph-corpuscles is seen. Parasites are so abundant as to constitute the greater part of the nodules. The majority of parasites lie free, and vary in their tingibility. The enlargement of the lymph-glands depends more on the immense number of parasites present than on a proliferation of the cellular elements. The parasites could be demonstrated in nearly all the organs, but produced no reactive inflammation. The absence of epithelial hyperplasia in guinea-pigs is explained on the ground that death occurs too soon for it to take place.

The author then proceeds to point out the striking similarity between the appearance of the blastomyces in the tissues and the so-called coccidia described by many writers as occurring in the malignant tumors of man, and comes to the conclusion that the latter bodies are not protozoa, but blastomycetes—a view that had been already advanced by Russell. [While we do not wish to deny the validity of Sanfelice's conclusions, we feel that they are based on insufficient premises. We cannot see, for instance, why cultures which have so often been made from the malignant tumors were devoid of results, seeing that the blastomyces grow readily on all media. That some of the yeasts are pathogenic cannot longer be doubted, but the nature of the lesions produced is still far from clear. Rabinovitsch in no case was able to find tumor-like masses in the experimental animals such as Sanfelice describes. Nor did Busse find what could properly be called tumors. Further studies are needed to show that blastomycetes are the true cause of cancer.]

Sanfelice[1] describes another pathogenic blastomyces which was obtained from the lymphatic glands of an ox that had died of primary carcinoma of the liver,

[1] Centralbl. f. Bakt. u. Parasit., xviii. 17, 18, Nov. 9, 1895.

with metastasis to all the lymphatic structures of the body. The peculiar character of the parasites consisted in the presence of a calcareous, glassy degeneration. The parasite grows on artificial media, especially near the surface, and closely resembles the Saccharomyces neoformans previously described by the author. Guinea-pigs inoculated subcutaneously or intraperitoneally with cultures of the parasite died in about 2 months. The lymphatic glands were found to be enlarged, and the great omentum contained a number of hempseed-sized nodules; a few were also found on the spleen and lungs, and, microscopically, in liver and kidney. The new parasite responded to Sanfelice's special stain in the same manner as Saccharomyces neoformans. It therefore resembles the latter in every way, except that it is accompanied by a peculiar hyaline degeneration. Hence the author terms it *Saccharomyces litogenes* [lithogenes?]. The parasite is found in large numbers in the lymphatic glands, but yet not so abundantly as is the Saccharomyces neoformans in animals inoculated with it. The reaction of the tissues is marked, but the new cells resemble the fixed elements, and there is no inflammatory reaction. The degenerated blastomycetes are soluble in the mineral acids, without the escape of gas except in the case of nitric acid. The alkalies produce no changes. The parasite is also pathogenic for white rats, rabbits, sheep, cattle, etc.

In an extended communication on the same subject,[1] the author deals more exhaustively with the development of the study of pathogenic blastomycetes and with his experiments on Saccharomyces litogenes. In reference to the latter, the histologic changes produced in the organs of experimental animals are described, though not with great clearness. In the guinea-pig the nodules produced in the kidney, which organ is most affected, have not an inflammatory character, since the nuclei of the cells of which they are composed do not present the appearance of emigrated leukocytes. The cells of the straight and the convoluted tubules present no degenerative changes. Nodules are abundant in the lung, and here consist chiefly of proliferated cells derived from the interstitial tissue. This hyperplasia of the connective tissue brings about an almost total disappearance of the alveoli. In the liver the nodules consist of a connective-tissue stroma, containing many giant-cells and uninuclear cells resembling in part hepatic, in part lymphoid, cells. In several places in the newly-formed fibrous tissue many new bile-ducts are seen. In the midst of the new tissue calcareous masses are found, some of which still permit one to recognize the original elements. The longer the animal lived after inoculation the smaller was the number of blastomycetes found and the greater the reaction of the tissues. Mice die in about 8 days after inoculation. The deposit of lime-salts (probably the phosphates) is ascribed not to the parasite, but to the body-cells, which in that way seek to protect themselves against the blastomyces. In conclusion, the author remarks that it is not only important to study how a blastomyces normally behaves in the tissues, but also in what manner it degenerates, as otherwise it is easy to confound the stages of degeneration of blastomyces with those occurring in the surrounding tissues. It is

[1] Zeit. f. Hyg. u. Infektionskrank., xxi. 3, 1896.

obvious that those investigators who look upon all elements described as carcinoma-parasites as degeneration-products, are on the wrong track. A bibliography concludes the paper.

Sanfelice,[1] in another paper, presents the results of animal-inoculations with **Saccharomyces neoformans.** In 2 out of 30 dogs inoculation made into the posterior mammary glands was followed by the formation of a tumor in situ and multiple metastases in the internal organs. Of 8 roosters, 3 presented neoplasms.

Busse[2] makes a further report on the **pathogenic yeast** discovered by him. Inoculation in white mice is invariably fatal, death occurring in from 17 to 33 days. (This is much later than was the case originally, probably on account of a reduction in virulence through transplantation.) The invasion of the tissues produces chiefly degenerative changes, while inflammatory processes, although they occur, are slight. The presence of immense numbers of yeasts can produce enlargements simulating tumors. The yeasts from different organs of the same animal vary considerably morphologically. While admitting the possibility that the cell-enclosures in carcinoma and sarcoma are yeasts, the author cautions against haste in forming conclusions, as only cultivation can tell whether the enclosures are parasites and, if so, to what group of beings they belong.

Braithwaite,[3] by treating sections of carcinoma and sarcoma with liquor potassæ and mounting in Farrant's solution, found what he considers **a fungus** passing through four stages: 1. Spores; 2. Zygospores; 3. Spore-masses and spore-bags; 4. Mycelium emitted from the ruptured spore-bags. [The fact that a fungus was also found in fibrous and mucous polyps and in diabetes, renders it probable that the author, who is modest enough not to assert categorically that he has found the cause of malignant disease, is himself deceived.]

BACTERIOLOGY.

The Specificity of Bacteria.—Hansemann[4] attacks the almost universally accepted theory of the specificity of some of the best-known microorganisms, among others the Klebs-Löffler, the cholera-, and the tubercle-bacillus, which he considers as *nosoparasites* (Liebreich)—*i. e.* as organisms that are found in conjunction with a disease-process, which they are capable of modifying, but not of causing. He also denies that the diphtheria-serum is specific, on the ground that the Klebs-Löffler bacillus is not the cause of diphtheria. [We have not space to discuss this subject, but we believe that Hansemann, like Hypatia, is defending, with brilliant skill, a hopeless faith.]

Motility of Bacteria.—Hill,[5] in a series of experiments undertaken to determine the relation between the possession of motility by bacteria and their ability to penetrate wet cotton, obtained the following results: 1. Motile bacteria readily penetrate wet cotton in any direction, the rate of passage varying

[1] Zeit. f. Hyg. u. Infektionskrank., 1896, xxii. 1, p. 171.
[2] Virch. Arch., cxliv. p. 360.
[3] Lancet, June 29, 1895.
[4] Berl. klin. Woch., July 29, Aug. 5, 1895.
[5] Canad. Pract., July, 1895.

for different species with the relative activity of their motility; 2. Nonmotile bacteria pass *downward* through wet cotton readily; 3. Nonmotile forms *may* pass *upward* through wet cotton, but such passage is very slow—requiring from a few days to 2 or 3 weeks; 4. Aerobic forms which are also motile, may utilize their motility to resist gravitation, remaining thus at or near the surface of a liquid medium exposed to oxygen. The experiments were made with U-shaped tubes. It was also found that the method employed apparently afforded a means of separating the motile typhoid from the nonmotile colon-bacilli.

The Influence of the Electric Current on Bacteria.—Friedenthal[1] in a critical review of this subject comes to the conclusion that only by the aid of heat and the formation of antiseptic decomposition-products is the electric current capable of destroying bacteria. Whether the electric current exerts an influence when heat and electrolysis are excluded, is still questionable.

The Effect of the *X*-rays on Bacteria.—Mink[2] exposed agar-plates planted with typhoid-bacilli to the action of *x*-rays from a Hittorf's tube, the exposure lasting from 2 to 8 hours, but found that the exposed plates showed no noticeable difference in development from control plates. [As far as these experiments go, the Röntgen-rays seem to possess neither a germicidal nor an inhibitory action on bacteria.]

Concerning the Penetrability of the Intestinal Wall for Bacteria.—Neisser,[3] from experimental studies concludes, contrary to Nocard, Porcher, and Desoubry, that the chyle is normally perfectly sterile, and also proves that normally bacteria do not penetrate the intestinal wall; even the presence of grave intestinal lesions does not suffice for the passage of saprophytic or of pathogenic bacteria. The occurrence of general infection by way of the intestines must be looked upon as rare, and as dependent on special bacteria and peculiar conditions. The body is, therefore, not threatened by a greater danger from the intestines than from the skin or other mucous membranes.

Bacteria in Fluids and Organs of Healthy Individuals.—Ferranini[4] confirms the observations of Chauveau, Daslie, Galippe, and others to the effect that the blood and internal organs of healthy individuals may contain microorganisms. Ferranini assumes the existence of a sort of symbiosis between the body and the microbes, which remains physiologic as long as the latter do no damage to the former.

Bacteria on Money.—Vincent[5] made cultures from the surface of various pieces of money by rubbing the surface off with moist sterile cotton pledgets, and then transferring the latter to nutrient bouillon. When the coins were laid directly into the bouillon the latter remained usually perfectly sterile, even if the pieces of money were very dirty. From the bouillon gelatin-plates were made, also animal inoculations. The number of bacteria was greatest on the copper coins, least on those of silver. Bacillus subtilis

[1] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Mar. 13, 1896.
[2] Münch. med. Woch., 1896, p. 101; ibid., p. 202.
[3] Zeit. f. Hyg. u. Infektionskrank., 1896, xxii. p. 12. [4] Rif. med., 1895, Nos. 59, 60.
[5] Rev. d'Hyg., 1895, No. 8, ref. Centralb. f. Bakt. u. Infektionskrank., Dec. 10, 1895.

and B. megatherium were common, less so proteus vulgaris. Staphylococci and streptococci were also found. Tetanus-bacilli and tubercle-bacilli, as well as the bacillus of malignant edema, were observed in a few instances only. The comparatively small number of bacteria on coins is ascribed by the author to a strong bactericidal action of the metal.

The Fate of Microorganisms in Inspired Air.—Thomson and Hewlett[1] have calculated that 1400 organisms are inhaled into the nose every hour; in a London atmosphere, however, as many as 14,000 may pass into the nasal cavities during one hour's tranquil respiration. The fate of the thousands of microorganisms which thus enter the human body is a question of great pathologic interest, and this increases when it is remembered that the expired air is practically quite free from germs. The interior of the great majority of normal nasal cavities is perfectly aseptic. On the other hand, the vestibules of the nose, the vibrissæ lining them, and all crusts formed there are generally swarming with bacteria. This seems to demonstrate that the vibrissæ act as a filter. Not only does this arrangement arrest the ingress of germs, but those which have penetrated into the nose are rapidly ejected by the action of the ciliated epithelium. The nasal mucus, though not found bactericidal by the authors, distinctly inhibits the growth of germs. By means of a skilful device they succeeded in proving that practically all or nearly all the microorganisms of the air are arrested before reaching the nasopharynx; probably a majority are stopped by the vibrissæ at the very entrance of the nose, and those that do penetrate as far as the mucous membrane are rapidly eliminated. The nasal mucus is an unsuitable soil for the growth of organisms, and hence is an important factor in that it does not further their multiplication. The removal of the intruding organisms from the Schneiderian membrane is probably in the main due to the action of the ciliated epithelium, assisted by the trickling of mucus and the lacrimal secretion. Phagocytosis may share in the work of removal, though to a small extent, for the authors only once found phagocytic cells containing bacteria.

Suppuration With and Without Microorganisms.—Poliakoff,[2] after reviewing the relevant literature, according to which it appears still in doubt whether suppuration can be produced without microorganisms, details his own experiments, which had for their object the determination—1. Whether the introduction of substances such as turpentine and croton oil into dogs and rabbits, performed with strict antiseptic precautions, could produce suppuration; 2. How different species of animals behaved toward the same amount of such substances; 3. In what respects bacterial and nonbacterial suppuration differed; 4. How it was possible to produce for substances such as turpentine conditions of effect on the tissues resembling those obtaining in the elimination of toxins by bacteria. Regarding the first question, the results proved that substances such as turpentine and croton-oil, if introduced in sufficient quantity, can in rabbits produce suppuration; otherwise other forms of inflammation are produced. With respect to the third question, writers have heretofore held that

[1] Lancet, Jan. 11, 1896.

[2] Centralb. f. Bakt. u. Parasit., July 27, 1895.

bacterial suppuration possesses the following characteristics: (1) it tends to spread; (2) the pus consists of multinuclear cells; (3) the pus contains peptone. Nonbacterial suppuration has no tendency to spread; the pus consists of uninuclear elements, and contains no peptone. The author points out that, as far as the first characteristic is concerned, it is well known that bacterial suppuration does not always spread. As for the second, he found that the pus produced by chemic irritants contains both uninuclear and multinuclear cells; the pus obtained in dogs with turpentine consists almost exclusively of multinuclear elements. Finally, chemic tests to determine the third point showed the presence of peptone in both bacterial and nonbacterial pus. The fourth question was investigated by the following experiment: Capsules of celloidin, which are pervious, were prepared, filled with turpentine, sealed, and then dipped in turpentine. Into one rabbit the author introduced 5 drops of turpentine with a Pasteur pipet, into another a celloidin-capsule containing the same amount of turpentine. The second animal developed an abscess the size of a walnut, and containing free the celloidin-capsule, in which some turpentine still remained. The other animal only showed an infiltration, but no pus. In dogs a celloidin-capsule with 4 or 5 drops of turpentine produced a large abscess containing pus, blood, and shreds of tissue; peptone was also present in the pus. What is the cause why the same quantity of a substance in the one case (injection) produces merely inflammation, in the other (celloidin-capsule) suppuration? It can depend only on the constant elimination of minimal amounts of turpentine into the tissues in the latter case. Experiments with dead cultures of staphylococcus pyogenes aureus were made. One rabbit received 2 c.cm. of the culture by injection, another 6 or 7 drops in a celloidin-capsule. The second developed an abscess, the first presented no effects. The pus was sterile. From these experiments it follows that the constant and slow elimination of toxins into the tissues, as it occurs in nature, and as may be imitated by experiments, produces the reaction of the tissues which we term suppuration.

Chauffard and Ramond[1] report 2 fatal cases of **tetragenus-septicemia.**

Bulloch[2] gives an exhaustive resume of the literature bearing on the role of the **streptococcus pyogenes** in human pathology.

Yellow Fever.—Finlay[3] reports experimental studies on the tetracoccus versatilis, which he considers the cause of yellow fever.

Bacillus of Foot-and-mouth Disease.—Siegel,[4] whose researches on foot-and-mouth disease are well known, has been able to isolate the bacillus described by him as the cause of the disease from the intestinal contents of persons and animals affected. An inoculation-experiment with a pure culture into a hog seems to have been successful.

A Pathogenic Anaerobic Bacillus of the Intestine.—Klein,[5] from

[1] Arch. de Méd. expér. et d'Anat. path., May, 1896.

[2] Lancet, Apr. 11, 1896. [3] Edinb. Med. Jour., Dec., 1895.

[4] Arch. f. Laryng., Bd. iii., ref. in Centralbl. f. Bakt., Parasit. und Infektionskrank., May 23, 1896. [5] Centralbl. f. Bakt. u. Parasit., 1895, Dec. 23, No. 24.

the fecal discharges of persons attacked by an epidemic diarrhea that had suddenly broken out in St. Bartholomew's Hospital, London, isolated by means of anaerobic cultures a bacillus to which he applies the name bacillus enteritidis sporogenes. The bacillus is pathogenic for guinea-pigs, killing them in from 18 to 48 hours. The milk having been suspected as the cause of the epidemic, cultures were made by the author, and the same peculiar bacillus obtained as from the fecal discharges. Morphologically and culturally, the bacillus resembles the bacillus butyricus of Botkin, but the latter is nonpathogenic. The lesions produced in animals are similar to those caused by the bacillus of malignant edema.

New Capsule-bacillus.—Wright and Mallory[1] found at the autopsy on a man aged 40 a new capsule-bacillus in the pus of a bronchopneumonic focus. It differs from Friedländer's pneumobacillus, and is perhaps identical with one of the numerous capsule-bacilli already described. Hertfeld and Herrmann[2] describe a capsule-bacillus isolated from the pus of an alveolar abscess. It is actively motile, grows well on all media, is not pathogenic for animals, and is peculiarly sensitive to temperature, already ceasing to grow at 38° C.; it grows well at 30° C. The authors term it Bacillus capsulatus mesothermus.

Chiari[3] describes a case of pyemia in which he found a capsule-bacillus differing from the hitherto known species. The patient, who had died after a short illness, presented a large series of lesions: suppurative nephritis, prostatitis and cystitis, endocarditis, splenic infarcts, otitis media, and meningitis. In all of these foci the same bacillus was present, the biologic features of which we can only briefly state: Pathogenic for all laboratory-animals, not staining by Gram's method, and forming gas in sugar-glycerol-agar. It differs in a number of points from the pneumobacillus of Friedländer. The primary lesion, the author believes, was in the urogenital apparatus, the cystitis being the first phenomenon.

Bacillus of Hemorrhagic Purpura.—Finkelstein[4] reports a case of hemorrhagic diathesis in a boy aged 8 days. In the organs he found a specific bacillus which kills mice by septicemia, and in rabbits, when introduced intraperitoneally, produces invariably a typical hemorrhagic diathesis, and thus deserves to be considered the cause of the disease in the boy. The organism, a plump, short bacillus with rounded ends, corresponds in its pathogenic behavior toward mice and rabbits with the bacillus hæmorrhagicus of Kolb, which the latter considers the cause of idiopathic purpura.

Microorganism in Chancroid.—Ducrey[5] believes that the streptobacillus observed by him is the cause of chancroid, although he has not yet succeeded in cultivating it artificially. By means of a series of inoculations he finally obtained an ulcer in which the streptobacillus was the only organism present. He looks upon this as a pure culture in the living tissues.

[1] Zeit. f. Hyg. u. Infektionskrank., 1895, xx. p. 220.
[2] Hyg. Rundsch., 1895, No. 14.
[3] Prag. med. Woch., 1895, Nos. 24–27.
[4] Berl. klin. Woch., 1895, p. 496.
[5] Monatsh. f. Prakt. Dermat., Bd. xxi. No. 2.

Organism resembling the Bacillus of Glanders.—Kutscher[1] isolated a microorganism closely resembling the bacillus of glanders from the body of a guinea-pig inoculated with the nasal secretion of a horse suspected to be glandered. This bacillus produces a white growth on potato, and stains by Gram's method. Injected into the peritoneal cavity of guinea-pigs, it causes Straus's glanders-reaction,[2] and thus renders this reaction valueless as a specific differential sign of the glanders-bacillus. Kutscher classes the bacillus with the group producing pseudotuberculosis.

TUBERCULOSIS.

Tubercle-bacilli in the Blood of New-born Infants.—Bar and Renon[3] injected into animals the blood from the placental end of the umbilical vein of 5 children, the mothers of which were tuberculous, and obtained positive results in 2.

Effect of Sunlight on the Tubercle-bacillus.—Migneco[4] placed tuberculous sputum on pieces of linen and other material and exposed them to the direct sunlight. He found that the tubercle-bacilli were killed in from 24 to 30 hours, their virulence being reduced in from 10 to 15 hours.

Tuberculosis of the Alveolar Processes.—Zaudy[5] in an exhaustive article on this subject states that the bacilli enter between the gum and the tooth; caries acts as a predisposing cause. The disease is most common between 15 and 50, and is more frequent in the male sex (23 men in 37 cases).

Tuberculous Cervical Glands and Carious Teeth.—Starck[6] found in 113 children having enlarged glands 41 % with carious teeth, the glandular enlargement corresponding nearly always with the position of the carious teeth. In 3 children with tuberculous glands carious teeth were found, but tubercle-bacilli could not be demonstrated in them. In a youth of 18 with tuberculous glands on both sides of the neck, tubercle-bacilli were found in two molar teeth of the left lower jaw. As, however, the glandular tuberculosis was bilateral, and as pulmonary tuberculosis was present, the case is somewhat equivocal. In a young girl of 14, otherwise healthy, the author found in a molar tooth with a carious cavity a tuberculous granulation-tissue at the bottom, and glandular tuberculosis on the same side only. This observation seems to point to a connection between the glandular tuberculosis and the carious tooth, with the reservation that an actual tuberculous process existed at the point of entrance of the bacilli. [The care of the teeth and other hygienic measures, to which the author also refers, take on renewed importance from these studies, especially when we consider the researches of Zaudy on tuberculosis of the alveolar processes. They should inculcate upon dentists the importance of the thorough sterilization of their instruments.]

[1] Zeit. f. Hyg. u. Infektionskrank., 1896, i. p. 156.

[2] The swelling of the testicles when the guinea-pig is inoculated in the peritoneal cavity with pure cultures of glanders-bacilli.

[3] La Sem. méd., 1895, No. 34.

[4] Ann. d'Igiene Sperim., nuova serie, vol. v., 1895, part 2; ref. in Centralbl. f. Bakt. u. Parasit., Dec. 10, 1895.

[5] Arch. f. klin. Chir., 1896, lii. 1.

[6] Münch. med. Woch., 1896, No. 7.

Tuberculosis of Mammary Gland.—Gaudier and Péraire[1] report 3 new cases of tuberculosis of the mammary gland.

Goldmann[2] reports a case, the first of its kind, of primary **tuberculosis of the tunica vaginalis testis.**

Tuberculosis in Early Childhood.—Kossel[3] reports 22 cases of tuberculosis in children, ranging from 2 months to 5 years, studied antemortem and postmortem; tuberculous foci were also found in 14 children that had died of other diseases—10 times in the bronchial and 4 times in the mesenteric glands. In none of the 14 had the tuberculous lesions caused any symptoms. The lesions in the whole series were most marked in the respiratory tract and the lymphatic glands belonging to it, secondly in the digestive tract. In one case only was the lesion confined to the intestinal tract of a child 8 months old, presenting an ulcer in the ileum and tuberculosis of the mesenteric glands. General or partial disseminated tuberculosis of the lung was the most frequent lesion. In the more chronic cases lobular and more extensive caseous pneumonias were added. In the hepatized portions it was always possible to demonstrate the presence of other microorganisms, especially streptococci and influenza-bacilli, the former occurring especially in cases of gelatinous infiltration, the latter in those in which the bronchopneumonia was associated with a purulent bronchitis and bronchiolitis. In one instance the influenza-bacillus had caused a fibrinous bronchitis. In one case the tuberculous process assumed the form of a cheesy tumor occupying the upper and middle lobes of one lung. The bronchial glands were affected in the majority of cases, in all but 2 apparently before the lung. In 9 cases the mesenteric glands were affected. The intestine was involved but twice. In 15 cases there was a general dissemination of the tuberculosis over the entire body. This tendency in children to general miliary tuberculosis is probably the reason why one rarely observes such extensive local destruction in the lung as in adults. The author, despite careful scrutiny, was not able to find the point of entrance of the bacilli into the circulation. Taking up the question how infants of but a few months of age become infected with tuberculosis, Kossel admits the possibility of hereditary transmission, which cannot be doubted since Birch-Hirschfeld's case, but believes that the vast majority of cases are infected after birth from contact with tuberculous persons.

Regarding the diagnosis, we may add, in this place, that the author succeeded in several instances in finding the tubercle-bacillus in the feces. [We would point out the overwhelming preponderance of the lesions of the respiratory tract in view of the widespread belief that the lungs are not as frequently affected in children as in adults. There can be no doubt that the view of the postnatal origin of tuberculosis is the correct one, though the possibility of a direct hereditary transmission is undeniable. As soon as we recognize the contagiousness of tuberculosis, as we sooner or later must, the ways of limiting its ravages become clear.]

[1] Rev. de Chir., 1895, No. 9. [2] Beit. z. klin. Chir., xiii. H. 2.

[3] Zeit. f. Hyg. u. Infektionskrank., 1896, i. p. 59.

Typhoid Fever.—Elsner[1] found that the addition of **potassium iodid** to an acid culture-medium was one of the most valuable **means of separating the typhoid-bacillus from the bacillus coli communis.** The medium is prepared by boiling gelatin with a potato-infusion (0.5 K. to 1 liter water), and then obtaining a proper degree of acidity, as recommended by Holz,[2] filtering, and sterilizing. The gelatin is placed into Erlenmeyer's flasks and receives 1% of potassium iodid. The culture is then inoculated and poured into plates. On this medium practically only the bacillus coli and the typhoid-bacillus will grow, but—and this is the important advantage of the method—the two organisms present different appearances. The typhoid-bacilli, namely, remain far behind the others in growth, being after 24 hours scarcely or not at all visible under a low magnification, while the colon-bacilli are fully grown at this time. After 48 hours the typhoid colonies appear as small, shining, very finely-granular colonies, resembling drops of water, the colon colonies being larger, more coarsely granular, and brown. On the dilution-plates a confounding of the two is impossible. The method also proves useful in isolating typhoid-bacillus from drinking water and feces. Even when the dilution was 1 : 8000 millions the bacilli could yet be demonstrated. In feces the bacilli were found as early as the 7th day and as late as the 6th week. [If further investigations prove what Elsner with apparently good reason claims for this method, the diagnosis of typhoid fever can be made in an early period of the disease, and, should a practically useful antitoxin be obtained, the treatment at once instituted.]

Bacteriologic Examinations of the Blood in Typhoid Fever.—Thiemich,[3] after reviewing the literature of this subject, details his studies made on 7 cases (6 of his own). The blood was taken in part from the rose-red spots, in part by means of a Pravaz syringe from a vein at the elbow, and transferred to fluid agar. In 3 cases the typhoid-bacillus was found in the spots, and once in the blood from the vein. In one case bacteria were absent; in the others, staphylococci resembling staphylococcus pyogenes albus were found. These, however, were not virulent, and may have been only epiphytes, although similar organisms were found in 2 fatal cases in the mesenteric glands, and once in the spleen. The author also tried to determine whether the bactericidal effect of the blood on the typhoid-bacillus is so prompt as to lessen the value of bacteriologic examination. He found, however, that the blood of a healthy man has no appreciable influence within 2 minutes, which is a greater time than usually was consumed from the withdrawal of the blood to its inoculation on nutrient agar.

Teissier[4] found typhoid-bacilli in the blood obtained from a vein of the

[1] Zeit. f. Hyg. u. Infektionskrank., 1896, II. 1, p. 25.

[2] Zeit. f. Path., 1889, Bd. xiii. To neutralize 10 c.c. gelatin, 2.5–3.0 c.c. of a decinormal sodium hydrate solution are required. Litmus-tincture serves as indicator. Sufficient alkali is added before filtration that the liquid reacts only slightly acid. During the sterilization the acidity increases. The reaction should always be tested after sterilizing.

[3] Deutsch. med. Woch., 1895, No. 34.

[4] Arch. de Méd. expér. et d' Anat. path., Sept. 1, 1895.

forearm in a case of typhoid fever on the sixteenth day of the disease. The bacilli were demonstrable only by cultures, not on cover-slips. The author believes that the presence of the bacillus in the blood may to a certain extent explain the determination of the arteritis or phlebitis usually considered secondary infections or due to the toxins of the typhoid-bacillus.

Septicopyæmia Typhosa.—Kühnau[1] reports the case of a pregnant woman, aged 32, whose illness began with malaise, fever setting in a few days later; labor occurred without complication. The patient, however, developed tympanites, diarrhea, roseola, enlargement of spleen, hypoleukocytosis, and albuminuria, and finally facial erysipelas. Decubitus and erysipelas of lumbar and gluteal regions preceded death. In the blood, during life, the author found typhoid-bacilli. At the autopsy the intestinal tract was found perfectly normal; the mesenteric glands were enlarged and in part necrotic; the kidneys contained minute abscesses; the right spermatic vein was thrombosed and presented, under the microscope, periphlebitic changes. From the mesenteric glands, the renal abscesses, the thrombi of the left spermatic vein, and the spleen the author succeeded in isolating the typhoid-bacillus. The case is one of typhoid septicopyemia. Whether the bacilli entered through the endometrium or through the intestines without producing there the primary lesion, as in the cases reported by Banti, Chantemesse, Adénot, Balp, Fernet, and others, the author is unable to decide. [The fact that the patient felt ill 6 days before her labor, and had some fever, would point to another place of entrance of the disease than the uterus. The enlargement of the mesenteric glands, as the author says, cannot be taken as positive evidence of intestinal infection, yet its presence strengthens the latter theory.]

Typhoid-bacilli in the Urine.—Wright and Semple[2] found typhoid bacilli in the urine in 6 out of 7 cases of typhoid fever. They agree with Wathelet and Sanarelli that typhoid fever is originally a blood-infection, and in view of the recent investigations (see *Year-Book* for 1896, p. 996) proving the absence of the bacilli from the feces, hold that while the latter may be disinfected as a precautionary measure, special attention should be bestowed on the disinfection of the urine. In every doubtful case, also, the bacteriologic examination of the urine should not be neglected.

Singer[3] found typhoid-bacilli in the urine of a case of typhoid fever.

Colon-bacillus in the Urine of a Typhoid-fever Patient.—Ljubomudroff[4] reports a case of typhoid fever in which blood and pure cultures of the colon-bacillus were excreted in the urine.

The Lymphoid Nodules of the Liver in Typhoid Fever.—Reed[5] discusses the nature of the so-called lymphoid nodules of the liver in typhoid fever. His conclusions, in part based on experiments on rabbits, are as follows: 1. The term "lymphoid nodule," by which these localized lesions of

[1] Berl. klin. Woch., July 27, 1896.
[2] Lancet, July 27, 1895.
[3] Wien. klin. Woch., 1896, May 14.
[4] Centralbl. f. Bakt. u. Parasit., 1895, Dec. 23, No. 24.
[5] Am. Jour. Med. Sci., Nov., 1895.

the liver in typhoid fever have been heretofore generally designated, is an improper one, since it expresses an erroneous idea as to the origin of these peculiar formations; 2. These so-called lymphomata are not composed of lymphoid cells which have wandered in from the portal vessels, but represent well-defined areas of cell-death; 3. In the earlier stages of the necrosis the nuclei which are found in such abundance in these areas are not the nuclei of lymphoid cells, nor do they arise from the multiplication of the nuclei of the hepatic cells, but owe their origin in small part to the disintegration of the nuclei of the liver-cells involved, and in greater part to the presence of multinuclear leukocytes which have wandered into the necrotic area; 4. At a later stage of the process, when the liver-cells have become quite broken down into granular detritus, the numerous nuclei which are observed along the margins of the area or are seen to have penetrated into its center are those derived from the connective-tissue stroma of the organ; 5. Thus it is probable that the areas of necrosis are replaced by well-defined areas of localized connective tissue; 6. Necrotic areas, resembling in all respects those found in the human liver in typhoid fever, can be reproduced experimentally in the rabbit's liver by the injection into the mesenteric vein of a pure culture of the typhoid-bacillus; 7. Although these areas of necrosis in the liver owe their origin to the action of the typhoid-bacillus, it has not been possible more definitely to determine in what way this cell-death is brought about; that is to say, whether it is due to the immediate presence of the bacilli within the areas of necrosis,

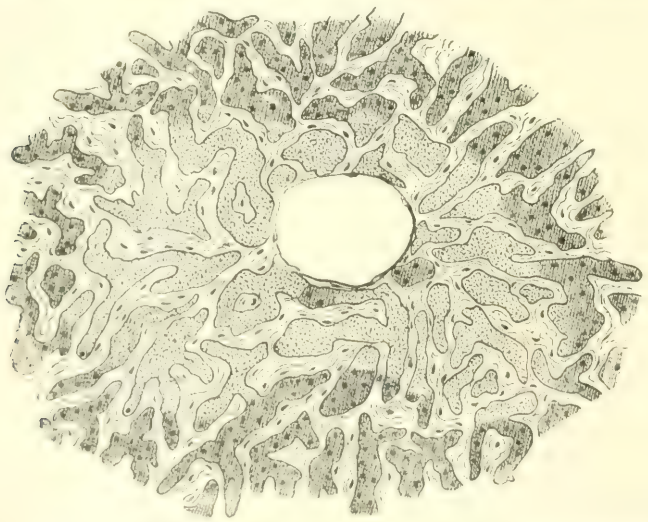


FIG. 124.—A necrotic area of the human liver in typhoid fever. The area of necrosis entirely surrounds the central vein of the lobule; the cells have lost their nuclei, but still retain their continuity with the healthy cells (Am. Jour. Med. Sci., Nov., 1895).

or is caused by the action of the so-called toxalbumins assumed to be present in the general circulation. The latter explanation would seem the more probable, since it is possible to produce well-defined areas of necrosis in the liver of guinea-pigs by the injection of toxalbumins alone, as has been done in

diphtheria, and by minute injections of ricin and abrin. [The sections were stained with Löffler's methylene-blue and eosin; the latter has a selective affinity for the degenerated areas. The illustrations (Figs. 124, 125) show well the microscopic appearances.]



FIG. 125.—Later stage or necrotic area of human liver in typhoid fever. The cells have entirely lost their shape; many small round nuclei within area *a*, and here and there a few spindle-cells (*b*) (Am. Jour. Med. Sci., Nov., 1895).

The Colon-bacillus.—Theobald Smith[1] calls attention to the behavior of bacillus coli and related forms in fermentation-tubes containing sugar-bouillon as a means of differentiation. The following points should be taken into consideration: 1. The evolution of gas, as to (*a*) total quantity, (*b*) rate of accumulation, (*c*) approximate composition, (*d*) temperature most favorable; 2. Formation of acids; 3. Behavior toward different carbohydrates. In the application of the test with bouillon containing carbohydrates other than the most easily attacked glucose or dextrose a difficulty arises. Most beef (and the flesh of other animals as well) contains a fermentescible substance acting like dextrose. In testing with dextrose this does not interfere. When, however, other sugars are to be employed, only that bouillon should be used in which gas does not appear during the multiplication of some gas-producing bacterium. The dextrose-free beef the author encountered in about one-fifth of the beef purchased. Recently he found the flesh from cattle in advanced stages of tuberculosis, those that show signs of emaciation, free from sugar. Such bouillon should be set aside and used only with saccharose, lactose, or other sugars, excluding dextrose. Beef placed in boiling water immediately after slaughter has also been found free from fermentescible substances.

The author then discusses the characters of the colon-group of bacilli, the presence of which in water he considers a valuable indication of pollution. He also points out the fundamental difference between B. coli on the one hand and the large hog-cholera group (including B. enteriditis and B. typhi murium) and the typhoid-bacillus on the other.

[1] Am. Jour. Med. Sci., Sept., 1895.

In another section the author discusses the methods of isolating B. coli from water. The two adopted by him are based on that by Rodet and G. Roux, and by Vincent: To flasks of bouillon containing about 100 c.cm. 50 c.cm. of water were added, the mixture quickly warmed and placed at 37° C. After 16 to 24 hours gelatin-plates were made, and rarely more than one species found. When membranes appeared on the bouillon the flask was tilted and the fluid for the plates taken from the deeper layers. By this precaution B. subtilis and other liquefying bacilli were avoided. Phenol was not added to the bouillon. The other similar process consisted in adding a small quantity of water to each one of a series of fermentation-tubes containing glucose-bouillon and placing them in the thermostat. The amount of water added depended on the probable amount of pollution, and varied from 0.1 to 1, or even more, c.cm. If after 2 or 3 days any tube indicated the presence of B. coli by the quantity of gas formed and the rate of evolution, plates were made from the deposit. Usually but one species, B. coli, appeared; sometimes two were found on the plates.

Grimberg[1] found the **colon-bacillus in the mouths of healthy persons.** It was found in 45% of the cases examined, and chiefly on the tonsils. Next in frequency was the staphylococcus aureus.

DIPHTHERIA.

Ascitic Fluid as a Culture-medium for the Diphtheria-bacillus.—V. Dungern[2] has found that the addition of ascitic fluid to the culture-medium increases the virulence of the diphtheria-bacillus.

Tenacity of Diphtheria-bacillus.—Aaser[3] found that disinfection of the room of the barracks occupied by a diphtheria-patient, together with sterilization of the clothing by means of steam at 110° C., did not check the spread of the disease. A bacteriologic examination of the throats of the soldiers in the barracks (89) was made: 17 tubes presented a growth of virulent diphtheria-bacilli. This discovery gave the clue to the spread of the disease. The 17 suspected cases were isolated: 1 developed diphtheria, 2 had a throat affection resembling lacunar angina; the others remained well, but the mucous membrane of the fauces was much reddened, and this did not disappear until the Klebs-Löffler bacilli could no longer be detected on culture of the mucus from the tonsils. In the same hospital in which the soldiers were isolated diphtheria developed in a convalescent patient in the scarlet-fever ward. Cultures from the throats of all the children showed that 20% harbored virulent diphtheria-bacilli in their throats. One of the children, in which the bacilli had been found on Oct. 6 and again on Oct. 31, no membranes having developed in the mean time, was sent home Nov. 2, with very few bacilli in the mucus of the tonsils. On Nov. 6 two younger sisters of the child were brought to the hospital with diphtheria, and no other mode of

[1] La Progrès méd., 1895, No. 43, p. 263.

[2] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 5, 1896.

[3] Deutsch. med. Woch., 1895, No. 22, p. 357.

infection than the child dismissed Nov. 2 could be traced. From these observations the author concludes that the germs of the disease were transported by persons, and not by clothes or other articles. Another interesting fact is that one of the isolated cavalrymen, who had no membrane in the throat, developed a well-marked, diphtheric paralysis of accommodation, which, the author believes, was due to the production of a certain amount of toxin which was absorbed. [These observations show the importance of isolating a patient convalescent from diphtheria as long as the presence of bacilli can be demonstrated by culture. In some cases, as we ourselves have experienced, it may become difficult to resist the demands of the parents, who, seeing no longer any membrane in the throat, press the physician to have the quarantine removed. But there can be no doubt either of the duty or the wisdom to continue isolation until the culture-test is negative.]

Bacteriologic Examination of Fatal Cases treated with Antitoxin.—Stokes[1] bacteriologically examined 9 fatal cases of diphtheria in which antitoxin had been used. The following are the results: In all of the cases the bacillus diphtheriæ was found postmortem in cultures from the respiratory tract. In 8 of the 9 cases there was a well-marked invasion of the blood by pyogenic cocci. In 5 cases the streptococcus was found in the liver, spleen, kidney, and blood of the heart; in 1 case in the kidney and blood of the heart, and in 1 case in the spleen. The pneumococcus was found in 2 cases in the kidney, in one of which the streptococcus was also found in the spleen. In the cultures from 1 case the only organism present was the bacillus coli communis. In the lungs of all these cases the bacillus diphtheriæ, streptococci, pneumococci, and the staphylococcus pyogenes aureus were found, either alone or in various combinations. The presence of mixed infection probably explains the fatal issue in spite of the use of antitoxin, for this cannot act against other organisms than the bacillus of diphtheria. As to the occurrence of the latter in the internal organs in these 9 cases, it was found in the kidney in 4 cases, and once in the heart and spleen respectively.

Influenza.—Nasstiukoff[2] accepts Pfeiffer's bacillus as the cause of influenza, and proposes a stain which is better than Löffler's solution or dilute carbol-fushsin recommended by Pfeiffer. The stain is prepared by adding to a saturated solution of the anilin dye (in absolute alcohol) a sublimate solution instead of distilled water. The author mixes 1 : 2000 sublimate solution (containing, for better solution of the $HgCl_2$, a little ammonium chlorid) with a few drops of anilin oil, and after agitation filters. The clear filtrate is added to the alcoholic solution of the dye. This mixture stains in a few seconds. Although not stained by Gram's method, they are not decolorized by Lugol's solution after having been stained by this mixture.

Pfeiffer had not succeeded in making plate-cultures of the influenza-bacillus. As blood is the best medium for the organism, the author believed that egg-

[1] Boston M. and S. Jour., Dec. 12, 1895.

[2] Etiology and Clinical Bacteriology of Influenza, Inaug. Dissert., St. Petersburg, 1894 (Russian); ref. in Centralbl. f. Bakt., Parasit. u. Infektionskrank., Apr. 8, 1896.

yolk, which chemically (in its animal constituents) closely resembles blood, might be serviceable. The yolk was dissolved in a 10% solution of NaCl, in which solution the vitellin is insoluble. A 2% agar-solution was then prepared. If the two are mixed at 50° C., the coagulation of the albumin can be prevented. The mixture must be at once poured into test-tubes, which are sterilized by Tyndal's method. On this medium the author succeeded in making plate-cultures of the bacillus and obtaining it pure.

In his clinical studies the author came to the conclusion that the bacteriologic examination of the sputum was sufficient for purposes of diagnosis. Inoculations of pure cultures into animals proved that the bacillus is pathogenic; healthy animals recovered; those weakened by other diseases succumbed sooner or later, which confirms the clinical observations in man.

CHOLERA.

Differential Diagnosis between Cholera-vibrios and other Vibrios.—Dunbar[1] has carefully applied Pfeiffer's reaction to various vibrios obtained from intestinal discharges and drinking-water. In order that the reaction be specific the following postulates must be fulfilled: 1. All vibrios recognized as true cholera-vibrios must react positively to the serum; 2. A given culture must react to a given serum at all times in the same manner; 3. The serum of animals immunized against cholera-vibrios, no matter what their origin, must always act upon true cholera-cultures, while it should not influence other cultures. Conversely, a serum obtained through cultures that did not react against true cholera-serum should not act upon true cholera-cultures; and 4. The cholera-cultures used for the experiments should be virulent or easily rendered so. From experiments based on these postulates the author concludes that Pfeiffer's reaction is to be considered specific, although caution should be exercised in positively pronouncing as cholera-vibrios all vibrios reacting to the cholera-serum. This is particularly true when the serum of immunized goats is used, for the latter seems to possess both a specific and a nonspecific bactericidal power, and transforms certain phosphorescent bacteria into granules, while the serum of guinea-pigs immunized to cholera does not do so.

Wiener[2] has succeeded in producing a general **infection of young cats by the administration of cholera-vibrios** by the mouth. The reaction of the gastric contents was in all animals strongly acid; sometimes also that of the upper portion of the intestines.

The same author[3] has repeated the experiments of Metschnikoff on the **influence of various species of bacteria on the cholera-vibrio.** Metschnikoff had shown that B. coli and some other organisms favored, and B. pyocyaneus retarded, the growth of the cholera-vibrio on gelatin-plates; furthermore, young animals inoculated by the mouth with cholera-vibrio and

[1] Zeit. f. Hyg. u. Infektionskrank., 1896, ii. p. 295.
[2] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 21, 1896.
[3] Ibid., May 8, 1896.

B. coli died more promptly than those receiving the vibrio alone. The author's results seem to confirm those of Metschnikoff. The addition of B. pyocyaneus to the cholera-cultures lessened the virulence of the latter.

The Gonococcus.—Steinschneider and Schaefer[1] draw the following conclusions from an experimental study of the biologic properties of the gonococcus: 1. The best medium is blood-serum or serous fluid of man, but the serum of the ox, sheep, dog, or rabbit may be substituted; these media are indispensable. 2. Urine-agar has not proved a reliable medium in their experience. 3. In Wertheim's plate method a sterile camel's-hair brush may be profitably substituted for the platinum-loop in spreading the pus over the surface of the serum-agar plates. 4. Exposure to a temperature of 40° C. for 12 hours or more not only inhibits the growth, but destroys the vitality of the organism. 5. When exposed to room-temperature for not too long a period, growth is inhibited, but not destroyed. 6. When gonorrheal pus is mixed with water or urine, gonococci may retain their vitality for from 1 to 2 hours, under favorable conditions even longer. 7. When introduced into the subcutaneous connective tissue the gonococci do not produce suppuration. Chadwick[2] could not confirm Turro's investigations (see *Year-Book* for 1896, p. 1000), and concludes (1) that the gonococcus does not grow on acid media; (2) that the gonococcus of Neisser undoubtedly causes true gonorrhea, but to make a certain diagnosis of this organism it must be found in considerable numbers and arranged in groups within the leukocytes. It must also decolorize very readily by Gram's method of staining. Hammer[3] employs albuminous urine for the cultivation of the gonococcus.

The Gonococcus as Cause of Pyemic Abscesses.—Bujwid[4] describes the case of a man, aged 32 years, suffering from gonorrhea, who 2 days after catheterization was seized with a chill, which repeated itself several times in the next 10 days. Four abscesses formed, all intramuscular, in various parts of the body, from the pus of which gonococci were cultivated on serum-agar. This proves that the gonococcus can cause pyemic processes.

Studies in Pathogenic Yeasts.—The class of hyphomycetes having been proved to possess pathogenic species, it was to be expected that disease-producing saccharomycetes should exist. Busse[5] isolated a species of yeast from a human subject suffering from a disease resembling chronic pyemia and characterized by suppurative changes in the skin, cornea, bones, spleen, and kidneys. Pure cultures injected into animals produced usually only local suppuration, but were fatal to white mice, in the blood of which the organism could be demonstrated. Colpe and Sanfelice have also found pathogenic saccharomyces, the former in a case of chronic cervical endometritis. Rabinowitsch[6] made a careful study of 50 varieties of wild yeasts, and found 7 that were pathogenic to lower animals. Experiments with cultivated yeasts were

[1] Berl. klin. Woch., 1895, No. 45.
[2] Boston M. and S. Jour., Oct. 3, 1895.
[3] Deutsch. med. Woch., 1895, No. 51.
[4] Centralbl. f. Bakt. u. Parasit., Oct. 26, 1895.
[5] Centralbl. f. Bakt. u. Parasit., 1895, Bd. xvi. H. 4.
[6] Zeit. f. Hyg. u. Infektionskrank., 1896, H. 1, p. 11.

negative. All of the pathogenic forms were harmless to guinea-pigs, but invariably fatal to mice, and at times also to rabbits. As they were, as a rule, demonstrable in large numbers in the blood and internal organs, it may be assumed that they acted through infection and not through intoxication. Tumors were never produced in the experimental animals. Yeasts could readily be found in the tissues, usually between the cells, sometimes within them. The yeast-cells are easily stained with all anilin dyes, a weak Ziehl's or methylene-blue solution being especially useful. Very clear pictures are given by Gram's method.

Immunity; Toxins and Antitoxins.—Gruber and Durham[1] have made a series of valuable observations bearing on the question of immunity, of which we give the conclusions: 1. Guinea-pigs can be rendered immune for a long period of time by the intraperitoneal introduction of dead or nearly nonpoisonous cultures of cholera-, typhoid-, or colon-bacillus. The bacterial bodies are not in themselves poisonous; the immunizing constituents of the bodies of bacteria are different from the bacterial poisons; 2. The immunity thus produced is a true immunity against infection, not against the toxins. This does not exclude the possibility of the production of an immunity against the latter in some other way; 3. The destruction of bacteria in the immunized animal is produced, as Pfeiffer has shown, under the influence of the body-juices. The multinuclear phagocytes play only an unimportant role in the phenomenon; 4. The "antibodies" are contained in the blood and fluids of immunized animals in active form; 5. They act in the actively and passively immunized animal exactly as they act upon the bacteria outside the animal body; 6. The "antibodies," the characteristic constituents of the blood and tissue-juices of the immune animal, have directly nothing to do with the killing of the bacteria; 7. The death of the bacteria is brought about by the alexins of Buchner, which are always present in the body-fluids and are not specific; 8. The chief effect of the antibodies is to cause a swelling of the envelopes surrounding the bacterial bodies. This is shown by the bacteria becoming glabrous, by a tendency on their part to unite in large globular masses, and by a loss of motility. On account of this fundamental action of the antibodies, Gruber terms them *glabrificins;* 9. By causing the bacteria to swell, the glabrificins render them amenable to the action of the alexins, through which their death is brought about; 10. In this process the glabrificins are used up; 11. Active and passive immunity are in their nature identical; both depend on the presence of glabrificins in the body-fluids; 12. There is no active immunity without the presence of glabrificins in the body-fluids; 13. The discovery that active immunity persists even after the antibodies have entirely disappeared from the body-fluids together with the power to confer passive immunity, depends on the fact that in the course of time the glabrificins lose their concentration to such a degree that the quantity contained in the dose of serum employed for conferring passive immunity is insufficient; 14. The presence of glabrificins in immunized animals could be demonstrated

[1] Münch. med. Woch., 1896, p. 206.

as late as 13 months after the last immunization; 15. The glabrificins are specifically different; every species of bacteria corresponds to a specific glabrificin; 16. Their action, however, is not specifically limited, but only differs in degree, every glabrificin acting most powerfully against its own species of bacteria; on other bacteria the action is the more marked the more related the bacterium is to the species; 18. The glabrificins are undoubtedly derivatives of the bacterial bodies (of specific proteins?), but are only formed in the immunized animal by some modification (combination with constituents of the infected organism?). The place of their formation is probably the macrophages, which eventually englobe the multinuclear leukocytes that are laden with bacterial products; 19. All the facts given apply only to cholera, typhoid, and related processes. In diphtheria- and tetanus-immunity the conditions seem to be materially different.

Heredity of Acquired Immunity.—Vaillard[1] from an experimental study comes to these conclusions: (1) The mother alone is capable of transmitting immunity to the descendants; (2) the father never transmits it; (3) the immunity received is of short duration, and disappears during the first months of life. The immunity of the offspring depends upon the action of the maternal plasma upon the fetal tissues.

Alkalinity and Immunity.—Calabrese[2] from a study of the influence of the alkalinity of the blood on immunity concludes that the alkalinity of the blood is a most powerful and constant means of defence of the immunized organism.

Protective Substances in the Blood of New-born Infants.—Fischl and v. Wunschheim[3] from an experimental study of the protective power of the blood of infants against infectious diseases conclude as follows: 1. The blood-serum of the new-born infant exerts no bactericidal influence upon the diphtheria-bacillus; 2. The blood-serum of the new-born infant does not attenuate the virulence of diphtheria-bacilli; 3. The blood-serum of the new-born is capable of preventing, in the great majority of cases, death from diphtheria in susceptible animals receiving separate injections of diphtheria-cultures and the serum in corresponding doses; 4. The blood-serum of the new-born is also capable of protecting, by separate injections of proper doses, guinea-pigs against the diphtheria-toxin; 5. By ascending doses of serum the percentage of recoveries from the effects of infection and intoxication is increased and convalescence shortened in time; 6. The injection of a mixture of toxin and serum under the skin of the abdomen of guinea-pigs produces no symptoms of disease in some cases, but in the greater number the animals die with typical appearances of intoxication; 7. Whether the result just described depends upon the irregularity of action of mixtures of the serum and toxin, or upon other accidental or unknown conditions, future experiments must show; 8. The greatest protective strength of the blood-serum of the new-born infant is the same as Wassermann found for the adult (one-twentieth

[1] Ann. de l'Inst. Pasteur, Feb., 1896.
[2] Il Policlinico, Feb. 15, 1896.
[3] Zeit. f. Heilk., 1895, Bd. xvi. p. 429; Prag. med. Woch., 1895, Nos. 45–51.

normal unit per c.c.), and the frequency of the occurrence of protective substances in the blood of the new-born is in the same ratio as that found by Wassermann for the adult; 9. That the protection manifested by the serum is not a *general peculiarity* of the serum is shown by the negative experiments in which the same quantities of serum were used; 10. In what manner the activity of the serum manifests itself in the animal body cannot be explained with our present knowledge.

Heating the serum to 55° C. did not destroy the protective bodies; hence these cannot be alexins, but resemble in their resistance to heat the specific antitoxins. As far as the age of the mother influenced the immunity of the child, it seemed that the best conditions prevailed between 21 and 25. The second and third births presented the highest percentage of protective bodies.

The Specific Immunity-reaction of the Typhoid-bacillus.—Pfeiffer and Kolle[1] from a carefully conducted series of experiments which it is not necessary to give in this place draw the following conclusions: 1. The serum of patients convalescent from typhoid fever contains substances which in minute doses are bactericidal against living typhoid-bacilli in the body of the guinea-pig, and dissolve them. The bactericidal action of the serum cannot be explained by the presence in it of a preformed bactericidal substance, but it is to be assumed that the introduction of serum into the guinea-pig produces a reaction in the animal's organism whereby the inactive "antibodies" present in the serum are transformed into an active specifically bactericidal modification. 2. Antitoxic substances are not demonstrable in the serum of convalescents from typhoid fever. 3. The serum of normal individuals, as well as that of persons suffering from a variety of diseases, possesses a certain influence against the intraperitoneal typhoid infection of guinea-pigs, but there is both a quantitative and a qualitative difference between normal serum and serum of convalescents from typhoid fever. The quantitative difference consists in that from 20 to 100 times the amount of normal serum is necessary to produce the same result; the qualitative, in that the normal serum possesses no specific action. 4. The action of the bactericidal substance of the serum of convalescents from typhoid fever is, on the other hand, a specific one—*i. e.* it is limited to the bacillus typhosus, and does not extend to bacteria resembling it. It can therefore be employed for the differentiation of the true typhoid-bacillus and its congeners. Moreover, the specific blood-changes can be used for the late diagnosis of a past typhoid process in convalescents. 5. The demonstration of specific bactericidal substances in the serum of convalescents from typhoid fever proves anew the sole etiologic role of the typhoid-bacillus in human typhoid fever and its specificity. 6. In the serum of goats immunized with ascending doses of living or dead typhoid-bacilli the same specific bactericidal substances are present as in the serum of convalescents from typhoid, but the quantity is too small to be therapeutically useful. 7. Antitoxic substances could not be found in the serum of immunized goats.

Specific Protective Bodies in the Blood of Animals Immune to

[1] Zeit. f. Hyg. u. Infektionskrank., 1896, ii. p. 203.

the Typhoid-bacillus and the Colon-bacillus.—Löffler and Abel[1] have sought to determine whether the serum of animals immune against the typhoid-bacillus had any protective action against the bacillus coli, and vice versa. The results of their studies are given in the following summary: 1. By treating dogs with increasing doses of virulent cultures of typhoid-bacilli or bacillus coli communis bodies are generated in their blood which possess a specific protective power only against that species of bacterium to which they owe their origin. 2. Ordinary serum of untreated animals exerts a protective action not only against the simple fatal dose of typhoid- or colon-bacillus, but also against low multiples of this dose. The size of the dose bears some relation to the quantity of serum previously introduced. 3. The specific protective power of the bodies in question is also clearly revealed when mixtures of serum and bacteria are injected. 4. Typhoid-serum protects against a somewhat larger dose of colon-bacilli than normal serum, and, conversely, the colon-serum likewise against a somewhat larger dose of typhoid-bacilli than normal serum. In this somewhat heightened protective power the relationship of the two bacteria is to a certain extent made evident. 5. The specific sera do not protect against the substances contained in the bodies of bacilli in a greater degree than ordinary serum. 6. By the injection of normal serum into the peritoneal cavity of guinea-pigs, and 24 hours later of double the fatal dose of dead bacilli, guinea-pigs can be rendered immune to the 100-times fatal dose of typhoid-bacilli within 2 weeks. 7. In case of intra-peritoneal inoculation of typhoid-bacilli, guinea-pigs bear within 48 hours the 100-times fatal dose if in the beginning a nonfatal dose is injected, and this is followed by ascending multiples of the fatal dose—*forced immunization.* 8. By the injection of 0.5 to 1 c.c. of a highly protective typhoid-serum animals that have been inoculated intraperitoneally with double the fatal dose can be saved 8 hours after an infection that in nontreated animals is fatal in 20 hours. 9. The author's experiments confirm the results of R. Pfeiffer with regard to cholera-serum.

Pfeiffer[2] sums up his recent observations on the specific **"antibodies" of cholera and typhoid fever** as follows: 1. The cholera-vibrios destroy when growing in bouillon-dilutions of cholera-serum the specific "antibodies" of cholera. Other vibrios, however, grow in this serum-bouillon mixture without directly attacking the antibodies. A partial destruction only occurs secondarily when, *e. g.*, by reason of the formation of metabolic products, the alkalinity or acidity of the medium reaches a harmful degree. 2. The specific antibodies affect in the test-tube the virulent cultures much less than the non-virulent. 3. In this easily determined difference we possess a measure of the virulence of a cholera- or typhoid-culture, since, *ceteris paribus*, the culture influenced by the greater dilutions of serum possesses a lesser virulence in the animal experiments. 3. When virulent cholera-cultures are used, it will be found, as previously pointed out by the author, that the inhibitory action of

[1] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Jan. 23, 1896.

[2] Ibid., May 8, 1896.

the cholera-serum *in vitro* becomes unnoticeable when the dilution approaches the lower limit of activity in the animal body. In such cases the vibrios are dissolved in the animal body, yet in the test-tube the phenomenon of agglomeration, upon which so much stress is laid by Gruber, does not occur. 5. The normal serum of several animal species contains bodies of a nonspecific nature which in the animal can cause the dissolution of cholera- and typhoid-bacilli. These normal serums possess also *in vitro* a noticeable inhibitory, but not specific, action on cholera- and typhoid-bacilli. Here, too, the less virulent culture is more markedly influenced than the more virulent, though the differences are not as striking as in the case of the immune serum. 6. The strict specificity of the cholera and typhoid antibodies is not in the least put in question by these observations.

The Specific Substances in the Blood-serum of Animals Immunized against Cholera.—Pfeiffer and Proskauer[1] have made a careful chemic study of the serum of animals immunized against cholera, in order to determine whether the specific substances which dissolve the cholera-vibrios belong to the group of albumins normally present or not. By means of Pfeiffer's reaction it is possible to test the substances isolated, both qualitatively and quantitatively. Without going into the minutiæ of their laborious and patiently-performed experiments, it will suffice to state that the specific "antibodies" belong neither to the globulins nor to the serum-albumins; they are also not extractives, nucleoalbumins, nucleins, peptones, or albumoses, nor are the nitrogenous and nonnitrogenous substances of the blood the cause of the specific action of the serum. The question to what group of bodies the protective substances belong is thus not answered, though it is materially elucidated. The authors believe that their experiments, as well as analogy, permit them to consider the protective bodies as enzymes.

Active Immunization against Cholera in Man.—Kolle[2] has immunized 15 persons, himself included, against cholera by the injection of dead cultures of the vibrio, his method being similar to Haffkine's. The first dose was $\frac{1}{12}$ of a 24-hour agar-culture, injected into the back; in 5 days the same dose of a living, very virulent culture was injected, and in 5 days $\frac{1}{8}$ of such a culture. The serum of the persons was tested before immunization, and was found to protect a guinea-pig in doses of from 0.6 to 0.75 c.c. against 10 times the minimal lethal dose. After the injections 0.003 c.c. were sufficient. This is especially interesting when it is remembered that Pfeiffer found the serum of cholera-convalescents to have a lowest active limit at 0.01 c.c. (against 0.003 in artificially produced immunity). It was also found by Kolle that a single injection of a somewhat larger dose ($\frac{1}{5}$ culture) produced the same effect as the repeated smaller doses. The high bactericidal value of the serum after the injection of such a small dose would seem to disprove Buchner's theory, that the immunizing substances of the serum are derived from the bacterial substances. It is more reasonable to con-

[1] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 21, 1896.

[2] Ibid., Feb. 5, 1896.

sider the cholera-antibodies as produced by an active reaction of the organism against the poisonous action of the bacteria. The protective action of the serum of persons vaccinated against cholera is strictly specific. The protection does not appear immediately after the inoculation, but only after a few days—not before the fifth day. As far as ascertained, the protective power of the vaccination lasts about a year. [On account of the rarity of epidemics vaccination against cholera will not be of such value in Europe and America as in India, but in case the disease should visit either continent measures could promptly be taken for the vaccination of exposed communities. Physicians, especially, could have themselves immunized. We would suggest that the bacteriologic laboratories of our seaports maintain cultures of virulent cholera-vibrios, so as to be able on short notice to furnish abundant vaccine.]

Haffkine's Cholera-immunization in India.—Kolle[1] reviews the work done by Haffkine in India, from which the conclusion is justified that the inoculation in man protects against cholera.

Serum-therapy in Tuberculosis.—Maffucci and Di Vestea[2] have tested the serum of "tuberculinized" sheep. (The adjective is applied to sheep treated with dead or living cultures of the tubercle-bacillus.) The guinea-pig, whether healthy or tuberculous, tolerates large doses of the serum; the rabbit, however, dies with symptoms of hemoglobinuria when injected with a dose of 0.4–0.5% to the body-weight. When a mixture of tubercle-virus and serum was injected into guinea-pigs, the animals died of tuberculosis at the end of a much longer period than the control animals. The serum did not possess a certain action, whether prophylactic or curative, on the experimental tuberculosis of guinea-pigs, but nevertheless produced (1) a longer duration of life; (2) a modification of the morbid process in its anatomico-pathologic character. In concluding the authors are of opinion that the serum possesses properties that are strongly analogous to those of tuberculin, and consider judgment in regard to sero-therapy in tuberculosis as premature.

Niemann,[3] in a series of experiments made for the purpose of obtaining a tubercle-antitoxin, found that an artificial immunity against infection with the tubercle-bacillus could be produced by subcutaneous injection of tuberculin or its active principles in dogs, goats, guinea-pigs, white rats, and hedgehogs. The immunity thus produced disappeared in from 4 to 7 weeks after the termination of the tuberculin-treatment. In the normal serum of the animals mentioned an antitoxic substance against tuberculin could not be found. The formation of antituberculin in the blood of the animals named (hedgehog not considered) can be achieved in one of two ways: (*a*) By the injection of mitigated tubercle-bacilli. (*b*) By treatment with tuberculin or its active principles. The simultaneous introduction of dead tubercle-bacilli seems to influence favorably the production of antitoxin. Goats from 1 to 2 years old are best adapted for the preparation of antitoxin. As the use of large quantities

[1] Centralbl. f. Bakt., Parasit., u. Infektionskrank., Feb. 21, 1896.
[2] Ibid.
[3] Ibid.

of tuberculin produces hemoglobinuria in consequence of glycerol-poisoning, the author now employs the toxin obtained by precipitation with alcohol. The antitoxic value of the serum in immunized animals is illustrated by two tables, from which we glean that the serum greatly prolongs the life of tuberculous guinea-pigs receiving a mixture of tuberculin and serum.

Babes and Proca[1] have been led to the following conclusions by their experiments with tuberculosis-serum: 1. The dead bacteria remain active, even after the careful extraction of the tuberculin, and produce lesions analogous to those caused by the living bacilli. 2. The effect of the serum differs in several points from that of tuberculin: (*a*) The antituberculosis-serum, even if injected in large quantities, produces no deleterious effects; (*b*) even in large quantities it causes only a slight rise in temperature; (*c*) if the serum is mixed with tuberculin, it paralyzes the action of the latter, but only when this is present in small quantities. 3. The serum prevents the local lesions produced by dead bacilli, and has a healing influence upon them when they exist. 4. When animals are injected simultaneously with tubercle-bacilli and serum, tuberculosis does not develop. 5. Tuberculosis may be cured if serum-injections are begun within a few days after infection. 6. The cure of the infected animals can be produced by relatively large doses of serum; smaller doses are ineffectual, and seem to increase the disease. In animals cured by this method no tuberculous lesions were found at autopsy performed several months later. 7. Media favorable to the growth of tubercle-bacilli become unfavorable when exposed for a time to the action of the serum. 8. Tubercle-bacilli mixed with antituberculosis-serum *in vitro* lose their virulence toward rabbits.

Johannessen,[2] in order to determine whether the **incidental effects of the diphtheria antitoxic serum** were due to the horse-serum *per se*, injected 22 persons (21 children, 1 adult) with serum from horses that had not been immunized against diphtheria. He is led to conclude from the experiments that the untoward effects of the serum-treatment are chiefly the result of the introduction of foreign serum, and advises that the antitoxin should be as concentrated as possible in order to lessen the quantity of serum injected, and also to be cautious in the use of the serum when diphtheria does not exist.

Loos[3] has investigated the **behavior of the blood-serum** of healthy and diphtheric children **to diphtheria-toxin.** 1. He endeavored to determine whether it was possible to demonstrate in the blood the presence of antitoxin that had been injected. A child of 3, whose blood had been found to possess but slight antitoxic properties, received 2000 antitoxin-units. The serum obtained by a second venesection 14 hours afterward presented indubitable antitoxic qualities. Attempts to find the antitoxin in the urine did not give positive results. 2. It was not possible to demonstrate a change in the blood-serum of children that had received a prophylactic injection (150 A. U.). 3. The third series of experiments was made for the purpose of determining

[1] La Méd. moderne, 1896, p. 37. [2] Deutsch. med. Woch., 1895, No. 51.
[3] Wien. klin. Woch., May 28, 1896.

whether after recovery from diphtheria the blood contained antitoxic substances. A 3-year-old child had been in the hospital for some time; its blood had been examined and was found almost devoid of antitoxic properties. The girl developed diphtheria. Fifteen days after convalescence, and also in 60 days, the author was able to demonstrate the existence of well-marked antitoxic properties in the blood-serum. 4. The author found antitoxic substances in the blood of 2 convalescent cases in whose blood they were not present during the course of the disease. 5. In the mouths of 2 healthy children highly virulent diphtheria-bacilli had been found at Prof. Escherich's clinic. The assumption that these children owed their immunity to antitoxic properties of their blood-serum was proved correct by experiment. 6. In one case of diphtheria the author succeeded in demonstrating the presence of toxin in the blood during life. 7. The question as to whether the antitoxic properties of normal blood-serum—*i. e.* of the serum of individuals that had not suffered from diphtheria—were permanent or not was settled in the affirmative. Any change, therefore, produced by diphtheria or by injections of antitoxins must be due to that cause.

Pawlowsky and Maksutow[1] describe **a new method of immunizing horses** for the purpose of obtaining a strong diphtheria-antitoxin. They first inject a considerable quantity of antitoxin under the skin, and then in 2 or 3 days the toxin, beginning with a large dose.

Treatment of Diphtheria with Artificially-prepared Antitoxin.—Smirnow[2] says if a diptheria-bouillon or serum-culture is subjected to electrolysis, the fluid at the positive pole becomes strongly alkaline, that at the negative pole strongly acid. If the two fluids are separated and neutralized with HCl and NaOH respectively, they not only lose their toxicity, but even acquire an immunizing power. Veal-bouillon was found to yield the strongest, horse-flesh bouillon the weakest toxin. The reaction of the medium is also an important factor. While the action of the artificial antitoxin is similar to that of the antitoxin obtained from immunized animals, it is noteworthy that, differing from the latter, an excess is distinctly injurious and must be carefully avoided. Experiments on guinea-pigs have shown that the antitoxin itself is not innocuous. It is, therefore, evident that the antitoxin obtained by electrolysis is nothing more than an attenuated toxin, the toxicity of which is diminished proportionately to the duration of the electrolysis.

Vissman[3] produced cloudy swelling in the kidneys of rabbits by the injection of diphtheria-antitoxin, and thinks that the use of **antitoxin** has increased the **death-rate** from diphtheria. [Despite these observations, overwhelming statistics by observers in all civilized countries testify to the value of antitoxin in diphtheria.]

Treatment of Typhoid Fever with Antitoxic Serum.—Börger[4]

[1] Zeit. f. Hyg. u. Infektionskrank., 1896, xxi. 3.

[2] Berl. klin. Woch., Nos. 30 and 31, July 29 and August 5, 1895.

[3] N. Y. Polyclinic, Nov. 15, 1895.

[4] Ref. in Centralbl. f. Bakt., Parasit. u. Infektionskrank., May 8, 1896.

employed antitoxic sheep-serum prepared by Beumer and Peiper, but could not observe any noteworthy influence on the course of the disease. The fact that cases of typhoid fever rarely come under treatment before the tenth day may have something to do with the negative results.

Chantemesse[1] has **immunized horses to the typhoid-fever bacillus.** The serum possesses such protective power that $\frac{1}{3}$ drop injected into a rabbit protects against the fatal dose introduced 24 hours later. The serum was used in 3 typhoid patients; all were perfectly well in 7 days from the first injection.

Antistreptococcic Serum.—Marmorek,[2] in order to procure a strong serum, first prepares a very virulent culture of streptococci by passage of the germs through a series of animals, and maintains the attained virulence by the use of a proper culture-medium, the best being a mixture of human blood-serum (2 parts) and 1% peptone-bouillon (1 part). Ascitic fluid may be used in the proportion of 1 part to 2 parts meat-bouillon. Ass's serum or mule's serum (2 parts to 1 of bouillon) and horse's serum (in the same proportion) may be employed, but are not so good. By growing the streptococci alternately in this medium and in the bodies of rabbits he has obtained cultures of almost incredible virulence. Horses and asses were immunized by the subcutaneous inoculation of cultures (not of toxins, since they were not obtained of great strength), and after a period of 6 months the serum of these animals was found to possess immunizing and, to a less extent, curative powers. Marmorek considers all pathogenic streptococci as belonging to the same species, the lesions depending on the degree of virulence and the point of entrance of the germs. An attempt was made to immunize horses that had already been immunized against diphtheria, and thus to obtain a serum that could be used in cases in which both the diphtheria-bacillus and the streptococcus are present in a pseudomembrane. Curiously enough, the horses showed almost no reaction after injections of virulent cultures of streptococci.

Therapeutic application of the serum has been made in erysipelas and other streptococcus-infections, but the cases treated are yet too few in number for trustworthy conclusions.

Antistaphylococcic Serum.—Kose[3] has been able partially to immunize a goat against staphylococcus. The serum of such an animal possesses antitoxic (but no bactericidal) properties.

Antianthrax Serum.—Marchoux[4] has obtained an antitoxic serum by the graduated inoculation of bouillon-cultures of anthrax-bacilli.

Sclavo,[5] by the injection of increasing doses of virulent anthrax-bacilli, the treatment having been begun with Pasteur's vaccine, was able to render sheep immune, and found that their blood possessed an antitoxic value. The author

[1] Soc. de Biol., session Feb. 29, 1896; ref. in Berl. klin. Woch., Mar. 16, 1896.

[2] Ann. de l'Inst. Pasteur, July, 1895.

[3] Časopis českych lékaru, Mar., 1896; ref. in Centralbl. f. Bakt., Parasit. u. Infektionskrank., May 8, 1896.

[4] Ann. de l'Inst. Pasteur, Nov., 1895.

[5] Centralbl. f. Bakt. u. Parasit., Dec. 23, 1895, No. 24.

hopes that it may be possible to treat anthrax in man and in animals by means of serum-therapy.

Erysipelas-toxins in Malignant Disease.—Czerny [1] does not think that cases of malignant disease are much benefited by injections of the combined toxins of erysipelas and micrococcus prodigiosus, yet believes that in inoperable cases the treatment deserves trial. In 2 cases—one a sarcoma of the parotid, the other a carcinoma of the upper jaw—he observed softening of the tumors and material improvement.

Serum-therapy in Carcinoma.—Salvati and Gaetano [2] injected 5 cases of carcinoma with the serum of a horse previously treated with intratracheal injections of the juice from a sarcoma. The lancinating pains disappeared for a time, but later returned. Hemorrhage from the ulcerated surfaces was a frequent sequel of the injection. No arrest of growth of the tumor took place.

Boureau [3] treated 7 cases with the serum of an ass injected according to the method of Richet and Héricourt. The animal received 55 c.cm. of a liquid obtained from an epithelioma of the breast and a carcinoma. The injections produced a prompt rise of temperature of 3° C., which was followed by a fall that was rapid after the first, but slower after the later injections; 2 bleedings, practised 6 days and 14 days respectively after the injections, yielded the serum which was injected into the patients. The author's conclusions are—1. That the serum of animals that have received inoculations from cancerous tumors produces a rapid amelioration (6 cases in 7) as regards pain, congestion, and suppuration. 2. That in the majority of cases this amelioration persists, but does not impede the course of the cancerous disease. 3. That although the method is not curative of cancer in the strict sense of the word, it nevertheless constitutes a form of treatment superior to any employed at present.

Héricourt and Richet, at the same meeting of the Société de Biologie, stated that the immediate effect of their method is without exception the production of a striking improvement.

Antitoxins and Toxins; their Preparation in the Dry State.—Brieger and Boer [4] have made a series of experiments to find a method by means of which the antitoxin could be obtained pure from blood-serum. The best precipitant was sodium chlorid combined with potassium chlorid, or at times with potassium iodid, acting at temperatures of from 30 to 37° C. The antitoxin could be completely isolated in this way, the strength of the serum not playing any part. Ten c.c. of diphtheria-serum yield 0.4 gr. of dried precipitate, which was soluble in about an equal quantity of water, but contained yet some albumin and salts. The salts were removed by dialysis. It was more difficult to remove the albumin. To a certain extent this could be accomplished by treating the antitoxin with magnesium sulphate in the incubator. The residue, which contained all the antitoxin, weighed 0.2 gr. By the same method of concentration the authors were able to extract all the anti-

[1] Münch. med. Woch., Sept. 3, 1895.
[2] Rif. med., Aug. 12 and 20, 1895.
[3] Comp. rend. de Soc. de Biol., 10th Series, t. ii. No. 27, Aug. 2, 1895.
[4] Zeit. f. Hyg. u. Infektionskrank., 1896, ii. p. 259.

toxin from the milk of goats immunized against tetanus. A liter of milk having an immunizing value of 30,000 yielded 1 gr. of a very soluble powder representing the original antitoxin-strength. An effort was made to isolate the toxins; mercuric chlorid, zinc sulphate, or, best of all, zinc chlorid, precipitates quantitatively the tetanus-toxin and diphtheria-toxin. The zinc-toxin compound does not contain a trace of albumin; hence diphtheria-toxins and tetanus-toxins cannot be considered albumins in the ordinary acceptation of the term. A liter of the toxic bouillon yields about 3.0 gr. of the dried zinc compound, of which 0.3 gr. are organic substances and represent the total amount of toxin. [It was natural to expect epoch-making work of this kind from the man who has done so much to advance our knowledge of bacterial poisons. From the practical point of view these investigations are of the greatest value, and lead us to hope that we shall soon be able to obtain the antitoxins in a solid, readily soluble, and nonperishable state. It is not out of the reach of possibility that we may yet be able to carry the curative substances in the hypodermic case.]

D'Arsonval and Charrin[1] have succeeded in **attenuating toxins** by passing constant or interrupted currents through them. By varying the strength of the current the toxins could be so altered as to serve as vaccines.

Antivenene.—Fraser[2] has continued his researches on antivenene, and comes to the conclusion that the latter is a chemic antidote to venom. The reasons for this conclusion are, in the first place, that a very much smaller quantity of the antivenene is required to neutralize the venom when the two are mixed in a test-tube than when they are separately but simultaneously injected. It was also found that when mixed in a certain proportion with the venom *in vitro* antivenene was able to prevent death from almost any dose of venom, however large it might be. Large doses of venom introduced into the stomach of animals failed to cause death, but seemed to produce a certain degree of immunity. This, together with the fact that the greater the quantity of venom introduced into the body the greater the quantity of antivenene produced, leads Fraser to conjecture that antivenene may be a constituent part of the venom itself. He does not believe that phagocytosis plays any part in the immunity, which he considers to be due to the chemical neutralization of the venom by the antivenene. At present the immunizing and curative value of the antivenene-serum is such that very large doses are required to produce results in the case of snake-bite in man, but the author hopes that it may become possible to separate the antivenomous principles from the inert constituents of the blood-serum with which they are mixed.

Technic—Pathologic and Bacteriologic.—Kanthack and Stephens[3] recommend the use of **serous fluid** (ascitic, pleuritic, hydrocele) for the preparation of a culture-medium for the diphtheria-bacillus.

McCann[4] suggests the use of **fluid from ovarian cysts as a culture-medium** for the gonococcus and other microorganisms.

[1] La Sem. méd., Feb. 5, 1896.
[2] Brit. Med. Jour., Apr. 18, 1896.
[3] Lancet, Mar. 28, 1896.
[4] Ibid., May 30, 1896.

Piorkowski[1] uses **urine culture-media** for differentiation of the bacillus coli and the typhoid-bacillus. The latter grows more slowly, and produces, on plates or in stab-cultures, a delicate, transparent growth, as if it had been breathed in (*eingehaucht*).

The Preservation of Virulent Cultures of the Streptococcus.—Petruschky[2] has found that by growing the streptococcus in gelatin for 2 days, and then placing the cultures in the ice-chest, the vitality and virulence of the organism are preserved for months.

Tochtermann[3] recommends the following **culture-medium** for the rapid cultivation of the diphtheria-bacillus. A 2% watery agar-solution, containing 1% peptone, 0.5% salt, and from 0.3 to 0.5% glucose, is boiled for from $\frac{1}{4}$ to $\frac{1}{2}$ hour with an equal part, or in the proportion of 2 to 3, of sheep's blood-serum. The filtrate is placed in test-tubes and sterilized in the usual way (for from 1–$1\frac{1}{2}$ hours on 3 successive days). The blood need not be received under antiseptic precautions; the serum is decanted after 24 hours. The presence of a few red corpuscles is not significant, as after boiling the filtrate becomes clear. If the medium, after remelting, is poured into Petri dishes and allowed to congeal, and is then inoculated with the diphtheric material, diphtheria-colonies may be seen with the microscope in 12 hours; in several cases they were found as early as 8 hours. [This medium would be very valuable if it would enable such an early diagnosis.]

Staining of Diphtheria-bacilli.—Crouch[4] states that if a cover-glass, prepared in the usual way from a serum-culture not older than 24 hours, is treated for a few seconds only with a 1% solution of methyl-green and then immediately rinsed and examined in water, very often the following will be observed: The majority of the bacilli are stained faintly green, and contain at both ends a well-defined round body much more deeply stained and of a distinctly reddish color. This is particularly striking in cultures containing mainly the shorter and uncharacteristic forms. The effect may be still further increased by the addition of other colors to the methyl-green for the purpose of contrast and increased penetration. Thus a combination of dahlia with the methyl-green is very effective. The following mixture has been found most suitable by the author: 5 parts of a fresh 1% solution of methyl-green, 1 part of a fresh 1% solution of dahlia, and 4 parts of water. The mixture improves with age. The peculiar staining reaction is claimed to be characteristic. The nature of these bodies is not known; they are different from the disks and striations of the ordinary preparations. The author considers them, with Ernst, nuclear in character. They stain with hematoxylin. After staining with dahlia-methyl-green, the bacilli may be stained faintly with Bismarck-brown; this gives very clear pictures.

Pittfield[5] recommends a **method for staining flagella** consisting in

[1] Centralbl. f. Bakt., Parasit. u. Infektionskrank., May 23, 1896.

[2] Ibid., xviii. No. 16, Oct. 31, 1895.

[3] Centralbl. f. innere Med., 1895, No. 40.

[4] N. Y. Med. Jour., Oct. 5, 1895.

[5] Med. News, Sept., 7, 1895.

the use of but a single solution, which is at once mordant and stain. The solution should be made in 2 parts, which are filtered and mixed:

A. Saturated aqueous solution of alum	10 c.cm.,
Saturated alcoholic solution of gentian-violet	1 c.cm.
B. Tannic acid	1 g.,
Distilled water	10 c.c.

The solutions should be made with cold water, and immediately after mixing the stain is ready for use. The cover-slip is to be carefully cleaned, the grease burned off in a flame, and after the slip has cooled the bacteria are spread upon it, well diluted in water, care being taken to exclude culture-medium. After the preparation has been thoroughly dried in the air it should be held over the flame with the fingers, as Löffler has directed. Afterward the stain is gradually poured on the slip and heated gently, bringing the fluid almost to a boil; the slip covered with the hot stain should then be laid aside for 1 minute, then washed in water, and mounted. The flagella are clearly stained. If the mixture is filtered, the preparation will be cleaner, but the flagella will not be stained as distinctly.

Hamilton[1] has devised a new **apparatus for the cultivation of anaerobic bacteria,** for a description of which we refer to the original.

The Cultivation of Amebæ.—Beyerinck[2] has succeeded in growing 2 species of ameba on solid media. The first, *Amœba nitrophila*, occurs associated with the nitrite-ferment; and the second, *Amœba zymophila*, which is perhaps identical with the amœba coli of Lösch, is found in some forms of alcoholic fermentation. (Concerning the preparation of the media see the original.) Schardinger[3] uses hay-infusion agar as a culture-medium for amebæ, and succeeded in growing a species, obtained from the stool of a patient suspected to be suffering from typhoid fever, which seemed to be identical with ameba coli. The medium is simply prepared: 30–40 g. of hay or straw are boiled with 1 liter of water; to the filtrate 1–1.5% agar is added; the mixture is boiled until the agar is dissolved, and Na_2CO_3 is added to an alkaline reaction. The material is placed in test-tubes without filtration. Celli[4] makes public a method for the cultivation of amebæ, which he and Fiocca described at a meeting of an Italian society in Nov., 1895. The best medium is made from fuscus crispus, which is prepared with 5% water, with or without bouillon, and is strongly alkalinized. It is almost impossible to obtain cultures of amebæ free from bacteria. The authors succeeded in cultivating a large number of amebæ, among them amœba coli. Regarding the etiologic relation of the latter to dysentery, they consider that it is not proved.

Jores,[5] noting that in the **conservation of tissue with formalin** the color of the blood was usually not perfectly preserved, found that the use of

[1] Brit. Med. Jour., Jan. 4, 1896.
[2] Centralbl. f. Bakt., Parasit. u. Infektionskrank., Feb. 28, 1896.
[3] Ibid., Apr. 25, 1896. [4] Ibid.
[5] Centralbl. f. Allg. Path. u. Pathol. Anat., 1896, No. 4.

salt-solution instead of water for diluting the formalin produced better results. At the same time, the tissues so treated are better adapted for microscopic study. He uses the following: Salt, 1 part; magnesium sulphate, 2 parts; sodium sulphate, 2 parts; water, 100 parts. Organs placed in the solution change color and assume a dirty hue, but when transferred to 95% alcohol the color gradually returns. The pieces may be kept in the alcohol until permeated, and afterward may be placed in an indifferent preserving fluid, a mixture of glycerol and water, in which the color assumes its natural tint.

Cullen's[1] method of **staining frozen sections** is as follows: (*a*) Place the frozen section in 5% aqueous solution of formalin for 3 to 5 minutes. (*b*) Leave in 50% alcohol 3 minutes. (*c*) In absolute alcohol 1 minute. (*d*) Wash out in water. (*e*) Stain in hematoxylin for 2 minutes. (*f*) Decolorize in acid alcohol. (*g*) Rinse in water. (*h*) Stain with eosin. (*i*) Transfer to 95% alcohol. (*j*) Pass through absolute alcohol, then through either creosote or oil of cloves, and mount in Canada balsam. By fixing the specimen in formalin before it is frozen the blood may be preserved. This process requires at least 2 hours. A small piece of the tissue is placed in a 10% solution of formalin and allowed to remain for 2 or 3 hours. It is then put on the freezing microtome and cut into thin sections. The great advantage of this method is the prevention of the contraction of the tissues, such as takes place when frozen sections are passed through alcohol.

Plenge[2] describes a **method of preparing frozen sections** hardened in formalin, which resembles that of Cullen. He uses a 4% solution of formaldehyd.

A Method of Reproducing the Naked-eye Appearance of a Microscopic Section.—Hamburger[3] describes the following process: The section is obtained and mounted in balsam in the customary manner. A piece of sensitized paper (3 of diagram below) is taken, and with its sensitive side is laid on the cover-glass (4), the section being on a glass slide (5); a piece of

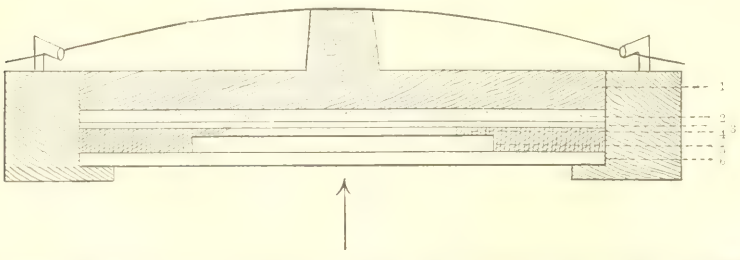


FIG. 126.—Method of reproducing the naked-eye appearance of a microscopic section (Rev. de Méd., Dec. 10, 1895).

rubber (2) covers the paper, and upon the rubber a plate of wood (1) is laid. The whole rests on the glass-slide (6). After having pressed the different layers together, the preparation is exposed to diffuse light. The time required

[1] Johns Hopkins Hosp. Bull., Apr., 1895. [2] Münch. med. Woch., Jan. 28, 1896.
[3] Rev. de Méd., Dec. 10, 1895.

is a matter of practice. The subsequent development is like that in ordinary photography. The balsam should always be hard before the preparation is photographed. All manipulations except, of course, the exposure are conducted in a darkened room (see Fig. 126).

MISCELLANEOUS.

The Diagnosis of New Growths by Microscopic Examination of Transudates.—Rieder[1] calls attention to the value of microscopic examination of peritoneal and pleural fluids in obscure cases in which malignant disease of the respective serous membrane is suspected. In a case in the care of Von Ziemssen the author found, in the fluid obtained by paracentesis abdominis et thoracis, cells occurring in masses and presenting atypical and irregular mitoses, and the diagnosis of malignant disease, probably carcinoma, was made. At the autopsy sarcoma of the peritoneum and pleura, omentum, and diaphragm was found, probably originating in the ovaries. In reference to the nature of cells found in transudates the diagnosis must be made between endothelial and cancer-cells. The latter are said by Quincke to give the glycogen-reaction [the assumption of a mahogany-brown color on the addition of a solution of iodin in glycerol]; they are of large size, occur in masses, and present atypical mitoses. An interesting feature in the author's case is the development of a new growth at the point of puncture in the abdominal wall. [The author terms the growth found by him on section of a peritoneal nodule a combination of sarcoma and carcinoma—sarcoma carcinomatodes. This can hardly be the proper conception of the tumor; it was either an alveolar sarcoma or that peculiar form of sarcoma termed endothelioma.]

On the Passage of Particulate Elements through the Diaphragm.—Sulzer[2] injected into dogs wheat-grits rubbed up in sterile salt-solution, in order to determine to what extent particulate elements in the abdominal cavity were absorbed by the diaphragm by entering the stomata directly, rather than by being carried into the lymphatics by means of leukocytes. The particles injected were, on a average, 20μ in diameter. The peritoneal surface of the diaphragm was found to be studded with little masses of the granules at points corresponding with the mouths of stomata which communicated with lymphatic spaces. The latter do not communicate with each other, but by fine branches with the rich lymphatic network on the thoracic side of the diaphragm. Both the spaces and the thoracic lymphatics were rich in granules. In the muscular portion of the diaphragm granules unenclosed in leukocytes were found. Particles four or five times the size of a red corpuscle can directly enter the stomata, and this is probably the primary mode, since absorption is well advanced in from 5 to 10 minutes. Later, particles enclosed in leukocytes are more numerous.

[1] Deutsch. Arch. f. klin. Med., Aug. 29, 1895.

[2] Virch. Arch., Jan., 1896, Bd. cxliii. p. 99.

The Fibrinoid Degeneration of Connective Tissue in Inflammation.—Neumann[1] believes that the fibrin-patches on the surface of serous membranes are not caused by an exudate, but by a fibrinoid degeneration of the superficial connective tissue, by which a modified albuminoid substance is formed, just as in amyloid degeneration. In favor of this is the localization of the patches, as over a tuberculous ulcer of the intestine or over a patch of inflamed lung, which, he maintains, would not occur if the material were exuded in a fluid state, as the rubbing of the pleuræ or the peristaltic motion of the intestine would tend to dislodge or to spread it. He was able to find islands of epithelium covering the patches, and at the edges of the patches the epithelium goes over and not under the fibrin. Fibrinous masses were found below the level of the surrounding epithelium, in the midst of connective tissue, and the fibers of the connective tissue were directly continued into the mass. Similar findings in the walls of tuberculous cavities, in the vegetations of verrucose endocarditis, and in inflammation of synovial membranes lead the author to ascribe these fibrinous formations to the same fibrinoid degeneration of connective tissue. [It is difficult to understand how the process described by Neumann could account for the thick fibrinous masses seen, *e. g.*, in fibrinous pericarditis, or for the stout bands that pass between the parietal and visceral layers of the pericardium in that disease. We doubt not that there is a coagulation-necrosis of the superficial tissues leading to the formation of a fibrinous substance, but an additional source is needed to account for the immense quantities of fibrin often found in serous membranes, and it is plausible to seek this in an exudation of a coagulable material.]

The Lesions produced by Lightning-stroke and other Electric Discharges.—Dürck,[2] from a study of a case in which lightning had caused instantaneous death, and from a review of the cases reported in literature, concludes that the electric current of sufficient tension, whether it be in the form of lightning or of a discharge from an electric machine, is capable of injuring or destroying the body by transient or permanent arrest of the respiratory or cardiac centers. The anatomic changes are: 1. Retarded or absent coagulability of the blood; 2. Usually circumscribed or extensive laceration of vessels in the track of the current; 3. At times disorganization of specially-affected parts; 4. The presence of superficial or deep wounds, resembling burns, at the points of entrance and exit of the current. Regarding the nature of the so-called lightning-figures (*Blitzfiguren*) further observations are necessary. Decomposition appears to be no more rapid than in other conditions.

The Importance of Granulation-tissue in Infection with Pathogenic Microorganisms.—Afanasieff[3] established wounds in various animals, and after 3 or 4 days inoculated pathogenic bacteria (anthrax, vibrio Metschnikowi) at the site of the wounds, and found that the animals survived. Granulation-tissue, he concludes, offers a sure protection against the entrance of virulent bacteria into the organism. The destruction of the bacteria planted

[1] Virch. Arch., May, 1896, Bd. cxliv. p. 201. [2] Münch. med. Woch., July 30, 1895.
[3] Centralbl. f. Allg. Path. u. Pathol. Anat., June 15, 1896.

upon the granulation-tissue begins with the action of the tissue-juices upon them; phagocytosis is observed later. Animals can be immunized by infection of a granulating wound with virulent cultures. The cultures obtained from granulation-tissue are attenuated. These researches indicate a new, simple, and certain method for the immunization of animals against various infectious diseases. At the same time it offers a prompt method of obtaining attenuated cultures that can serve as vaccines. [These studies are interesting, but whether the method is applicable to man is questionable. We shall look forward to the author's promised thesis with great interest.]

Surgical Infectious Diseases.—Kocher and Tavel[1] discuss this subject—Kocher from the clinical, Tavel from the bacteriologic standpoint. Of interest to us is the terminology proposed by the authors. Tavel distinguishes sharply between infection and intoxication. There are two chief classes of infections—that from the outside, *exogenous*, and that from the blood, *hematogenous*, infection. If bacteria develop at a distance from the point of introduction, the mode is termed *resorption-infection*. The latter may be exogenous or hematogenous. The word septicemia the author would drop entirely, and would differentiate between blood-infection—*bacteremia*, and blood-intoxication—*toxinemia*. The term "mixed infection" should also be discarded, and *polymicrobic* infection used instead. The latter is *homologous* when all foci are produced by the same association of bacteria; a *heterologous* infection may be a monoinfection when the same species of bacteria is not found in all foci, but in every focus only one exists. Inflammation and suppuration are considered as healing processes in the sense of Metschnikoff, in which phagocytosis is the most active factor. A chapter is devoted to *staphylomycosis*. The authors would drop the term pyemia and designate the conditions produced by invasion of staphylococci as *staphylomycosis circumscripta acuta* and *chronica*, *staphylomycosis multiplex* and *metastatica*, and *staphylohemia*.

Toxicity of the Aqueous Part of the Breath.—Livierato[2] investigated the toxicity of the aqueous vapor expired by healthy and by sick persons. Expired air was received and the aqueous vapor condensed in suitable apparatus; the fluid obtained was then injected into rabbits with the following results: 1. Aqueous vapor from persons suffering from diseases of the respiratory tract, with fever, injected into rabbits, produced a fever which lasted from 3 to 6 days, general torpor, and diminution of reflexes. 2. These effects were less accentuated in the case of patients who had no fever. 3. The aqueous vapor of febrile patients having no respiratory trouble caused no fever or only very slight fever in rabbits. 4. The vapor of healthy individuals had no appreciable effect. 5. Identical results were obtained when the liquid was sterilized.

The Pathology of Talalgia.—Brousses and Berthier[3] contribute an interesting study of a case of this disease. The pathologic condition—the symp-

[1] Vorlesungen über chirurgische Infektionskrankheiten, Teil 1; ref. in Centralbl. f. Bakt., Parasit. u. Infektionskrank., Apr. 25, 1896.

[2] Arch. ital. de Biol., 1895, tome xxiii. p. 289; Brit. Med. Jour., Oct. 5, 1895.

[3] Rev. de Chir., Aug., 1895.

toms having been an almost unbearable pain on resting the foot upon the heel—consisted in an interstitial neuritis of an anomalous nerve curving through the bursa normal to the heel.

Flagellate Protozoa in the Intestinal Canal of Man.—Schürmayer[1] found flagellate protozoa, evidently a form of trichomonas, in the intestinal canal of a child 1 year old, suffering with symptoms resembling summer-complaint. The organisms were spindle- and club-shaped, possessed two flagella at the enlarged end, and contained bodies (contractile vacuoles) the exact nature of which was not entirely clear. It was found impossible to secure cultures of the protozoa free from bacteria. Schmidt[2] found **protozoa** (trichomonas pulmonalis) **in the sputum** of 3 patients—2 with aspiration-pneumonia, 1 with gangrene of the lung. In all cases the parasites were found in the Dittrich's plugs.

Trichomonas as a Parasite of Man.—Dock[3] adds the third case of trichomonas in urine to those already known (Marchand, Miura). The patient, a man of 27 years, had difficulty in urination and periodic hematuria. The author describes exhaustively the morphologic and biologic properties of the trichomonas, to which he attributes pathogenic power, which in the case reported manifested itself in the production of hematuria and pyuria.

[1] Centralbl. f. Bakt. u Parasit., Oct. 5, 1895, p. 324. [2] Münch. med. Woch., 1895, No. 51.
[3] Am. Jour. Med. Sci., Jan., 1896.

PEDIATRICS.

By LOUIS STARR, M. D., and THOMPSON S. WESTCOTT, M. D.,

of Philadelphia.

The Year's Work.—While the work in our department during the year has been more diversified than in the preceding twelvemonth, as a result of the gradual subsidence of the excitement over the diphtheria antitoxin, there is little of novelty to record, though good earnest work along all lines is to be noted. Diphtheria is still actively under discussion. Concerning the new treatment the verdict of the profession, as gathered from the literature, is becoming gradually more and more emphatic that antitoxin surpasses in value all other remedies, and as the importance of early injection is being realized the results are correspondingly better. Touching the subject of scarlatina some suggestive claims have been advanced. Experiments with Marmorek's antistreptococcic serum have in general been disappointing, and this agent seems to have little or no effect in preventing the usual streptococcic complications of the disease. Whether the streptococcus found in scarlatinal complications (for its presence in the uncomplicated disease is now questioned) possesses properties differing from those of the erysipelatous germ, as is likewise claimed, remains for future demonstration.

The very exceptional occurrence of typhoid fever in children under the age of two years seems now fairly proved. Varicella is gradually assuming a position among infectious diseases entitling it to greater respect than has previously been accorded it, what with the possibilities of complicating nephritis, as shown last year, and of suffocative laryngitis, as demonstrated by Marfan and Hallé's interesting observations referred to in the present volume. In the treatment of pertussis phenocoll hydrochlorate seems to be the latest claimant for specific honors, and vaccination is again brought forward. Kossel's plan of making cultures from the stools of children with tuberculous pulmonary lesions with the view of detecting the bacillus in swallowed sputa is worthy of more extended trial. The importance of what may be termed the maternal factor in the etiology of rickets is emphasized by Garrod and Fletcher. Quincke's operation of lumbar puncture seems to be destined to take rank with exploratory celiotomy as a method of direct diagnosis. Many instances of its positive results have been recorded during the year, and it is generally agreed that the operation is harmless if properly done, though alarming symptoms are recorded in 1 case under the care of American observers.

PHYSIOLOGY.

The Increase in Weight of Premature Infants.—Potel devotes his thesis[1] to a consideration of the increase in the weight of premature infants, basing it upon a study of 173 infants born at periods from $6\frac{1}{2}$ to 8 months of intrauterine life, who survived the dangerous period and were discharged from the maternity after a sojourn of an average of 82 days for the $6\frac{1}{2}$-months' children and of 28 days for those of 8 months. At $6\frac{1}{2}$ months there was a survival of 19.6%. The average increase in weight per day for one of these children was 9.4 gm. At 7 months the survival was 41.9%; the mean daily increase of weight was 11.5 gm. At $7\frac{1}{2}$ months the survival was 69% and the increase of weight 13.8 gm. At 8 months 64.5% survived and the daily increase averaged 22.8 gm. The average weights at birth were as follows: At $6\frac{1}{2}$ months, 1408 gm.; at 7 months, 1700 gm.; at $7\frac{1}{2}$ months, 1900 gm.; and at 8 months, 2150 gm. The loss of weight of the first 3 days in the premature is not more marked than in infants at term, but its consequences are more grave, since the recovery of the initial weight takes longer; it is also during this period of loss or stationary weight that the mortality is highest, those infants exempt from hereditary taint being the most resistant.

Hemihypertrophy.—A case of congenital unilateral asymmetry, very similar to that reported by Adams (see *Year-Book* for 1896), has come under the notice of Kopal.[2] In this case there was increase of size of the face, limbs, neck, thorax, abdomen, pelvis, and scrotum upon the right side of the body, together with bilateral enlargement of the tongue—a feature not observed in Adams's case. A portion of the enlarged tongue was removed, showing no abnormality except an increased thickness of the muscular fibers.

Chemistry of Bile.—Baginsky and Sommerfeld[3] present a new analysis of the bile in childhood, based upon specimens taken from the dead bodies of 115 children whose livers were in a healthy condition. The ages varied from 3 months and younger (55 cases) to between 2 and $2\frac{3}{4}$ years (18 cases). Comparing their results with Jacubowitsch's[4] well-known analysis of the bile of new-born babies and sucklings, we find that as regards water, mucin, salts, and cholesterin the two analyses are practically the same. The new analysis, however, shows the presence of glykocholic acid, which did not appear in Jacubowitsch's results, and also of leucin, which, like lecithin, was found in unexpectedly large proportion.

INFANT-FEEDING.

A New Sanitary Nursing Device.—Decker[5] describes an improvement upon the usual form of nursing-bottle and nipple. The bottle is a graduated glass cylinder with an uncontracted outlet. The nipple is formed like a woman's breast, consisting of a broad elastic diaphragm fitting over a flange on the top of the bottle, with a short nipple projecting from its center.

[1] Paris, 1895.
[2] Prager med. Woch., No. 33, 1895.
[3] Archiv f. Kinderheilk., Bd. xix. S. 321.
[4] Jahrb. f. Kinderheilk., Bd. xxiv. S. 373.
[5] N. Y. Med. Times, Nov., 1895.

The fluid is thus discharged into the front of the mouth instead of directly down the throat, and its flow is much slower than that from the common nursing-bottle. This breast-nipple is reversible and easily cleansed.

Bottle-cleansing.—For cleansing nursing-bottles Seibert[1] recommends Heubner's use of green soap and warm water, but has been able to increase the germicidal action of this soap by letting the bottles stand for hours filled to the very top with the soap-water, and later, instead of a bristle bottle-brush, using plugs of absorbent cotton wound around the end of a strong wire to wipe away all remaining particles of milk, a fresh plug to be used for each bottle. Whenever possible, two sets of bottles are used.

Analysis of Condensed Milks.—A significant commentary on the use of condensed milk as a regular diet for infants is found in the report of the English Commission recently appointed to examine into the milk-supply of London: 17 brands of condensed milk were examined, and of this number 14 were found to be prepared from skimmed milk and showed an average of 0.72% of fat; 3 brands prepared partly from skimmed milk showed an average of 3.14% of fat. When it is considered that genuine condensed milk prepared from whole milk contains from 10 to 12% of fat, the food-value of most of the preparations on the market can readily be judged.

Analyses of Cow's Milk.—Heubner[2] brings additional testimony to the support of his analyses,[3] showing a low percentage of albuminoids in human milk, against the criticisms of Pfeiffer,[4] Biedert,[5] and Camerer,[6] who contend for a higher proportion. He criticises the precipitation-method of Ritthausen, employed by Pfeiffer, as being more liable to error than the method of Kjeldahl, which estimates the nitrogen and from this calculates the albuminoids. He refers to the analysis of Johannessen (see *Year-Book* for 1896, p. 526), which gives an albuminoid percentage of 1.104, and shows that if Wroblewski's factor 6.7 be used instead of the usual 6.25, or 6.37 which Johannessen used, a result of 1.16 is obtained, only .04 less than Forster's figures. In a later note[7] Heubner calls attention to a paper by Munk,[8] who in 13 analyses obtained a maximum percentage of only 1.55% and an average of 1.21%, which is almost identical with Forster's figures. A very complete review of the literature for the past few years on the subject of cow's milk in infant feeding will be found in a paper by Sommerfeld.[9]

Sterilization.—Troitzky[10] has found that complete sterilization of milk is not accomplished in less than 1½ to 2 hours at a temperature of 100° C., reckoned from the moment when this temperature is attained. The probability of infection of sterilized milk from exposure to the air, he has found, increases with each uncorking of the bottle after the first or second time.

[1] N. Y. Polyclinic, July 15, 1895.
[2] Jahrb. f. Kinderheilk., Bd. xl. S. 121.
[3] Berl. klin. Woch., Nos. 37 and 38, 1894.
[4] Verhandl. der 11. Versammlung der Gesell. f. Kinderheilk., Wiesbaden, 1895, S. 126.
[5] Berl. klin. Woch., No. 44, 1894.
[6] Der Stoffwechsel des Kindes, Tübingen, 1894, S. 141.
[7] Jahrb. f. Kinderheilk., Bd. xl. S. 241.
[8] Virchow's Arch., Bd. 134.
[9] Arch. f. Kinderheilk., Bd. xx. S. 93.
[10] Ibid., Bd. xix. S. 97.

For reasons that are at present undetermined raw milk affords a better culture-medium for microorganisms than sterilized milk.

Gärtner's Fat-milk.—Gärtner[1] reports further satisfactory results from his "fettmilch." In a series of 25 infants fed upon this diet for periods varying from 2 to 4½ months the average daily gain in weight was 20.6 g. (4⅜ oz. per week). The intervals of feeding are rather longer than those usually adopted: for the 1st week, 2½ to 3 hours; 1st to 2d month, 3 hours; 3d to 5th month, 3½ hours; and 6th to 12th month, 4 hours—with the usual 1 or 2 feedings during the night. In cases of feeble digestion, where a percentage of 1.5 to 1.7 of casein is not well borne, dilution with water or 6% milk-sugar solution, in the proportion of 2 of milk to 1 of water, gives a mixture containing only 1% of casein, but more than 2% of fat; while dilution of whole milk to a 1% casein standard leaves scarcely 1% of fat in the mixture. Somewhat different results have been obtained by Popper[2] in a series of 25 cases, in only 3 of which did increase of weight above the average occur during the administration of Gärtner's mixture. Of the remaining 22 cases, 14 actually lost weight, 4 neither gained nor lost, and 4 gained, but less than the normal average increase. It is noticeable that the great majority of the infants who lost weight were under 6 months of age, and in 8 cases in which the digestion was described as normal before this feeding was begun some form of indigestion was noted at the end of the period of trial. Thiemich and Papiewski[3] also have studied the effects of this preparation in cases of chronic dyspepsia in nurslings, and conclude that it is neither better nor worse than diluted milk—a verdict, it is fair to say, which is questioned by Gärtner[4] in the course of a long critical review of the literature bearing upon his milk-mixture. Keilmann,[5] on the other hand, taking his material from healthy new-born children, finds that in the first 10 days of life fat-milk preserves the original weight more nearly than any other artificial mixture of cow's milk. Healthy breast-fed children (181 cases) regained all but 18 g. of the initial weight in this period; infants fed on cow's milk 1 : 1 lacked 195 g., and those on cow's milk 1 : 3, 176 g.; while the fettmilch infants were only 66 g. behind. Encouraging results were also obtained in older infants. [For the purposes of this investigation it would seem no more than just that comparison should be made with better mixtures than simple diluted milk. The low fat-percentage of either of these dilutions gives an a priori advantage to any mixture richer in cream, and thus institutes a worthless comparison between fat-milk and a recognizedly unsatisfactory mixture.] Analyses of this mixture by impartial observers show a fairly constant average composition. Thiemich and Papiewski[6] found an average of 1.67% albuminoids and 3.2% fat, and Rupp[7] in 24 analyses obtained 1.46% casein and 3.2% fat.

[1] Wiener med. Woch., Dec. 21, 1895.
[2] Arch. f. Kinderheilk., Bd. xix. S. 223.
[3] Jahrb. f. Kinderheilk., Bd. xli. S. 372.
[4] Wien. med. Woch., May 30, 1896 et seq.
[5] Jahrb. f. Kinderheilk., Bd. xli. S. 312.
[6] Loc. cit.
[7] Forschungsr. über Lebensmittel und ihre Beziehungen zur Hygiene, Jahrg. 1896.

Cautley's Modification.—Cautley[1] proposes a simple method for obtaining a modified milk that closely resembles human milk in composition. Taking an equal quantity of mixed cow's milk and a 10% solution of lactose, the whole is passed through a separator so arranged that the two outgoing streams are equal; it is thus divided into two equal parts, one of which contains practically the whole of the cream, and may be termed "cream milk," while the other contains practically no cream, and may be termed "skimmed milk." The composition of "cream milk" derived from a cow's milk containing proteids 4.0, fats 3.7, and lactose 4.4, was shown to be proteids 2.0, fats 3.5, lactose 7.2, which closely approaches the average of the analyses of breast-milk obtained by Leeds (proteids 2.0, fats 4.0, lactose 7.0). Another mixture of slightly lower proteid percentage (proteids 1.82, fats 3.7, and lactose 6.88) was well borne and digested by infants in the Belgrave Hospital for Children. An advantage claimed for the mixture is that it can be diluted without altering the relative proportions of the different solid constituents to each other. [The method seems to be an improvement upon the one recently suggested by Gärtner, in that the milk-sugar lacking in this mixture is already supplied in the process of preparation according to Cautley.]

Steffen's Mixture.—Wilhelm Steffen[2] calls attention to a milk-preparation which his father, the elder Steffen, used with great satisfaction for many years. The peculiarity of the mixture lies in the use of a weak veal broth as a diluent, the salts of which he believed played an important role in its digestion. The recipe for this broth is as follows: $\frac{1}{4}$ lb. of veal is boiled with $\frac{1}{2}$ liter of water for from $\frac{1}{2}$ to $\frac{3}{4}$ hour, and the loss is made up to the half liter by the addition of boiled water; this has been found to contain 0.2 to 0.3% of salts. Fifty g. of good whole milk are now diluted with an equal quantity of this broth, giving in the mixture a proportion of about 1.75% of fat. The deficiency in fat is made good by the addition of a teaspoonful of a 30% cream, and the sugar is brought up to normal by the addition of 3.8 g. of milk-sugar. The analysis of such a mixture gives fat 3.1%, casein 1.8%, sugar 6.2%, which agrees closely with accepted analyses of human milk and of Gärtner's fat-milk. Other dilutions may be made for the first weeks of life, or in later months when nearly whole cow's milk can be digested, and additional amounts of fat and sugar can be readily computed. Numerous experiments with this mixture in artificial digestive media have shown that it is precipitated in fine, feathery curds. When first taken into the stomach, as shown by regurgitation and by catheterization, the curds are larger and more cheesy, but still easily broken, but at the end of an hour the stomach contains only fine, feathery curds. The nutritive qualities of this mixture are said to be all that can be desired, and after 20 years' experience the author knows of nothing that promises better results.

Whey-and-cream Mixture.—Backhaus[3] reviews the various methods for preparing milk-mixtures, such as Voltmer's (which is very similar to the

[1] Lancet, Jan. 11, 1896.

[2] Jahrb. f. Kinderheilk., Bd. xl. S. 421.

[3] Berl. klin. Woch., July 1, 1895.

better known "humanized milk" of Leeds), Rieth's albumose-milk, somatose-milk, Gärtner's fat-milk, and Kehrer's whey-and-cream mixture, and finds some room for criticism in each. With the last mentioned, however, he is nearly satisfied, and has therefore devoted much care and study to its improvement. By centrifugation he separates the cream from the milk. The milk may be sufficiently sterilized by "discontinued heating" (practically, pasteurization repeated several times). By the use of rennet under proper conditions a whey is obtained containing about 1% of albuminoids, consisting only of albumin, serum-protein, and lactoprotein, with about 5% milk-sugar. Condensation under lessened pressure to $\frac{4}{5}$ of the original volume yields a percentage of 1.25 albumin and 6.25 sugar. The addition of a proper quantity of cream gives casein 0.50 and 3–3.5 of fat, thus affording an analysis very closely resembling human milk. Several other variations may readily be made. The ash is slightly higher than in human milk, but less than in cow's milk. [The method fails to simplify the now well-known synthetic combination of milk-mixtures as brought prominently into notice in this country by the Walker-Gordon laboratories. Something seems to be gained, however, by eliminating a large part of the casein and increasing the more easily digested albumins, and by avoiding the necessity in general for adding milk-sugar.]

Lahmann's Vegetable Milk.—Höck[1] describes his experience in feeding 31 infants upon this product, which is made, according to Lahmann's formula, from almonds and other nuts with the addition of sugar. It contains fat 24.6%, plant casein 7.5%, cane-sugar 41.8%, plant dextrin 1.3%, calcium, potassium, etc. 0.68%, and water 24.44%. Used in combination with cow's milk in the proportion of 1 : 1 or 2 : 1, it is said to be precipitated in fine flocculent curds. Omitting 5 cases which died from conditions necessarily fatal, the remaining 26 cases showed only 2 in which weight was lost and 3 in which the daily gain was small. In the others the daily increment varied from 17 g. to 70 g., averaging for all these cases 30 g.

The Dresden Modification.—Worcester[2] describes the method of preparing milk for infants' feeding known as "the Dresden modification." The superiority of the method rests mainly upon the recognition of an essential difference between casein and lactalbumin. Lehman's analyses of breast milk and cow's milk, embracing the results of 10 years' study, show that while the casein of cow's milk is 3%, as compared with 1.2% in human milk, the albumin is as 0.3 to 0.5, so that the dilution of cow's milk with water sufficient to reduce the casein to the amount found in human milk gives a mixture containing only $\frac{1}{3}$ enough lactalbumin. Further loss is occasioned by the process of sterilization, since the coagulated albumin is wasted in the scum and by clinging to the sides of the bottle. The Dresden modification aims to make good this loss by the addition of the white of 1 egg to 1 pint of cow's milk ($9\frac{1}{2}$% fat), $1\frac{1}{2}$ pints of water, and 13 drams of milk-sugar. The egg should be washed, rinsed in absolute alcohol, and broken over a bowl or mortar, the white

[1] Wien. med. Woch., Mar. 7, 1896. [2] Boston M. and S. Jour., Sept. 19, 1895.

alone being taken. The milk-sugar is then slowly added and vigorously stirred with the egg-white, care being taken not to beat air into the mixture. To the paste so made 1½ pints of water are slowly added by constant stirring. This emulsion is strained through fine linen into the sterilized milk (when sterilization is desirable), previously cooled down below 100° F. Slight stirring or shaking will now complete the mixture, when it may be poured into the requisite number of nursing-bottles. In regard to this deficiency in lactalbumin, Leeds[1] states that in practice the results of adding egg-albumin are very disappointing, the operation of preparing and adding the egg-white to dilute milk being "troublesome and messy." He believes that as an attenuant butter-fat acts much more efficaciously, since it is almost perfectly coprecipitated with the casein, and cannot be removed from the clot by the most exhaustive washing—a result which he has shown occurs when the clot containing egg-albumin is subjected to the washing process. When cow's milk of average composition is diluted with half its volume of water and ⅛ part of the total in average cream added, the analysis gives—

	Fat.	Casein.	Albumin.
Cow's milk	3.75	3.00	0.75
Cream	18.80	2.00	0.50
Modified milk	4.13	1.74	0.44
Human milk	4.12	1.35	0.65

In this mixture, he contends, the insoluble proteid is about as much too high in amount as the soluble proteid is too low, and therefore the addition of albumin alone does not overcome the excess of casein. He therefore maintains that the most satisfactory method of overcoming the excess of insoluble proteid is by means of an incipient and very partial peptonization of the casein—a process which at the same time effects a practical sterilization of the mixture. [As a matter of clinical experience we can most heartily endorse the claims of Prof. Leeds for his "humanized milk," and have never encountered an example in which future digestion has been impaired by this often-asserted "method of encouraging inactivity, and consequent functional atrophy, of the peptic glands."]

DISEASES OF THE NEW-BORN.

Bacteria of the Intestine in the New-born.—Schild[2] has studied the bacteriology of the meconium of 50 new-born infants before any form of nourishment was administered. By making cultures from the rectum at various intervals after birth it was found that the meconium, which was sterile at birth, became infected at the end of 4 hours in the earliest instances, and not later than 20 hours in any of the cases, the average time being between the 10th and 17th hours of life. The following microbes were encountered: the porcelan-coccus of Escherich; the liquefying fluorescent bacillus, the nonliquefying fluorescent bacillus, the bacillus subtilis, the colon-

[1] Am. Jour. Med. Sci., Sept., 1895.

[2] Zeit. f. Hyg. u. Infectionskrank., 1895, Bd. xix. S. 113.

bacillus, the proteus, and a bacillus which the author was unable to classify. It is interesting to note that the bacillus coli communis was found very infrequently, and the bacterium lactis aërogenes never, thus confirming Escherich's earlier studies of the meconium. Under the conditions of the observations the mode of infection was by way of the anus, this being conclusively proved by the fact that in 3 cases subjected to disinfection and antiseptic dressing of the perianal region the meconium remained sterile for a longer period than in any of the other cases.

Double Monsters.—Jacobi[1] describes a double monster belonging to the class of pygopagus (see Fig. 100, p. 465) born under the care of Tynberg in New York City. The children died at the age of 5 months and were submitted to postmortem examination, the notes of which are given. The case is stated by Jacobi to be the fourteenth on record. Jacobi[2] also describes a case of ischiopagus which was seen in 1889 in the practice of Cooper of Groomesville, Ind. The children throve well, and, but for an attack of measles followed by a fatal pneumonia at the age of 8 months, bid fair to prove an exception to the statement made by Ahlfeld in his classic work[3] that no specimen of this monstrosity had been known to live more than a year.

Inanition-fever in the New-born.—Under this name Holt[4] calls attention to the fact, first noticed by McLane of New York, that pyrexia, often of marked degree, may occur in the first 4 or 5 days of life, dependent apparently upon insufficiency or absence of the breast-milk. He advises that the temperature of every new-born child should be taken during the first week. Diagnosis depends upon exclusion of all other causes of fever, coupled

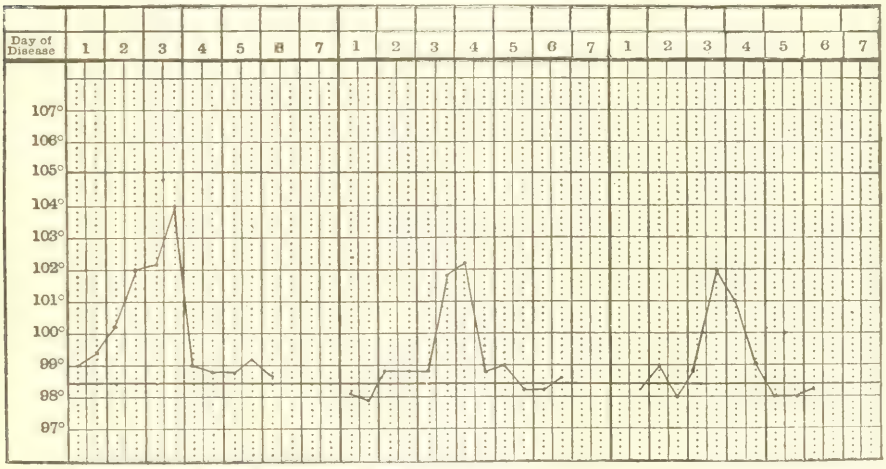


FIG. 127.—Charts of starvation temperature (Arch. of Ped., Aug., 1895).

with evident insufficiency or absence of the maternal breast-milk. Pyogenic infection, with which this fever might be confounded, rarely begins before the

[1] Arch. of Ped., Oct., 1895.
[2] Ibid., Mar., 1896.
[3] Die Missbildungen des Menschen, Leipzig, 1880.
[4] Arch. of Ped., Aug., 1895.

fifth or sixth day. The treatment is simple—water regularly every 2 hours, in quantities up to an ounce at a time if required by the thirst of the child. This should be given in every case when the temperature reaches 101° F. In case the temperature does not at once begin to fall, the infant should be put upon another breast or artificial feeding be begun. Cormier [1] also reports 2 typical cases due to the fact that the milk did not readily flow from the mother's breasts. Like Holt, he thinks the term "inanition-fever" an unsatisfactory one, although, as Holt says, it seems to emphasize the connection of elevated temperature with the fact that food is insufficient or entirely wanting. ["Starvation-fever of the new-born," or "starvation temperature," the latter a term suggested by Tucker, would express the condition more accurately.] Tuley [2] also refers to this fever, and gives 3 temperature charts, which are shown in the accompanying illustration (Fig. 127).

Icterus Neonatorum.—Schreiber [3] believes that, of all the theories advanced to explain the occurrence of icterus neonatorum, Quincke's is the only one that sufficiently explains all the facts. This theory attributes the condition principally to the persistence of the venous canal of Arantius; the biliary pigment absorbed from the intestine would pass directly by this avenue into the general circulation, and would not be retained, as in the adult, in the liver. Besides this principal factor, Quincke cited several subordinate ones—namely, the abundant production of bile through the destruction of red blood-cells, the scarcity of urinary excretion in the new-born, the richness of the meconium in bile-pigment, and the nontransformation, in the intestine, of bilirubin and urobilin, due to the absence of intestinal putrefaction in the new-born. These propositions Schreiber verifies from his own observation. Quincke cited 5 cases of persistence of the canal; the author has observed it in 7 cases, and calls attention to the results of Elsässer, who in 200 infants dying within the first 8 days found the canal closed in but 23, and in only 3 out of 78 which had perished very shortly after birth. Injection-experiments demonstrated that the blood passes through the canal, and by other experiments he was able to show that blood from the intestine passes by the hemorrhoidal veins into the vena cava without passing through the liver. Concerning the absorption of bile-pigment from the meconium, the author has shown by experiments upon dogs that, when bile was injected into the rectum, in all cases the bile-pigment appeared in the urine and the hemorrhoidal veins showed evidence of staining. The conditions of urinary excretion are also important, for it is evident that when little urine is passed in the early days of life the system is imperfectly relieved of the bile-pigments.

Sclerema Neonatorum.—A suggestive contribution to the etiology of this rare disease is to be found in the report of Schmidt [4] upon 3 cases which were most carefully studied. From the blood of all 3 children bacteria were isolated. The capillary vessels were crowded with bacteria, which were also found free in the connective tissue, in the parenchyma of the lungs, and in

[1] L'Union méd. du Canada, Oct., 1895. [2] Arch. of Ped., Aug., 1895.
[3] Berl. klin. Woch., June 24, 1895. [4] Zeit. f. Geburtsh. u. Gynäk., Bd. xxii. H. 2.

the subcutaneous fibrous tissues. Cultures in 1 case showed the bacillus proteus and also a liquefying germ. Further studies in this direction are necessary, but it seems likely that the disease may properly be considered an infection, though the point of entry, which was apparently not the umbilicus, could not be determined. As regards the health of the patients, the mother of 2 of these children had had 7 healthy children before and 2 subsequent to those manifesting the disease.

Tetanus neonatorum has received some attention in the literature of the year, especially at the hands of J. Lewis Smith,[1] who covers the subject very completely. Special interest attaches to the reports of the value of the antitoxin treatment, which are, as yet, meagre. Escherich, quoted by Smith, has treated 4 cases of the disease in the new-born by Tizzoni's antitoxin, one of which recovered; in the fatal cases septic inflammation of the umbilical cord was present, and all exhibited septic symptoms. In the case that recovered an injection of 0.3 g. was given on the third day and twice on the fourth. A case recorded by Firth,[2] beginning on the 7th day of life, received 4 injections—the first on the 8th day of the disease, 6 gr., the second and third on the 9th day, and the last on the 10th day, death from cramp asphyxia occurring 7 hours later. Smith believes that in order to be efficient the remedy should be used early, and that the hydrate of chloral, with perhaps one of the bromids, should still be employed. Local antiseptic treatment of the umbilicus is also highly important, since this is the common avenue of infection. An unusual case, in which tetanus followed ritual circumcision performed in the usual manner by the mohel, the wound being dressed without care, is recorded by Schirman.[3] This case recovered under the use of chloral by rectal injections, together with brandy, extract of conium, potassium bromid, and warm baths twice a day. Chloral and sodium bromid were also successful in a case reported by Carr.[4] Two fatal cases were seen by Rosenthal.[5] Marcy[6] has seen 8 cases, 7 of which, among negroes amid filthy surroundings, proved fatal. In the case that recovered tincture of solanum carolinense was pushed to narcosis; pilocarpin was also used, because the kidneys did not act sufficiently. Fronz,[7] in a resume of the cases of tetanus treated in St. Ann's Hospital during the past 30 years, gives the mortality at all ages as 44%, and that of tetanus neonatorum alone (14 cases) as 50 %. In the new-born sepsis is a more frequent accompaniment than in adult life, and dangerous complications, such as pneumonia and gastrointestinal diseases, are very apt to occur; new-born children are less susceptible to the tetanus toxin than are adults.

Melena Neonatorum.—A complete bibliography is appended to a paper on this disease by Lewis,[8] who adds 3 cases coming under his own observation to a series of 183 cases collected from the literature. A study of these statis-

[1] Arch. of Ped., Dec., 1895.
[2] Brit. Med. Jour., Jan. 19, 1895.
[3] N. Y. Med. Jour., Aug. 3, 1895.
[4] Arch. of Ped., Nov., 1895.
[5] Cod. med., Sept., 1895.
[6] Phila. Polyclinic, Oct., 1895.
[7] Jahrb. f. Kinderh., Bd. xl. S. 133.
[8] N. Y. Med. Jour., Feb. 1, 1896.

tics does not show a sufficiently large number of cases in which hemophilia is definitely proved to be the cause to warrant the belief that melena is a manifestation of this diathesis. He remarks the fact that so little investigation has been recorded in reference to the condition of the cranial contents in fatal cases, and refers especially to the experimental study of Pomorski,[1] who succeeded in producing congestion, and possibly hemorrhage, in some portion of the alimentary canal of new-born rabbits by directly or indirectly injuring the vasomotor centre. Upon this ground the latter observer concluded that hemorrhage into the brain occurring during labor constitutes the principal factor in the causation of melena, and therefore he thought that the brain-hemorrhages which have frequently been found at autopsies upon children dead of melena are no longer to be regarded as complications, but as the cause of the other symptoms. To this view the author apparently gives assent.

Finkelstein[2] reports the case of a new-born infant dying of hemorrhage. In the organs a specific bacillus was found resembling the one found by Kolb in 3 cases of purpura hæmorrhagica, and called by him bacillus hæmorrhagicus. Cultures of this organism injected into rabbits caused a typical hemorrhagic condition. In the case reported the mother was syphilitic, but the author looks upon this disease as simply predisposing to the hemorrhagic diathesis, for which pyemic or septic infections are more directly responsible.

Gonorrheal Arthritis.—Haushalter[3] adds a new case to the few already reported in which arthritis was associated with purulent ophthalmia in a new-born infant. The right knee and left wrist were the joints involved; the knee was severely affected, presenting an abundant effusion containing polynuclear leukocytes and showing the presence of the gonococcus. A study of the 11 or 12 cases thus far recorded shows that there is no interrelation between the date of appearance of the joint-symptoms and the course of the primary infection. In the author's case the knee began to swell during the decline of the conjunctival discharge, while in Lindermann's patient the joint became affected after the cure of the ophthalmia. In the great majority of cases blennorrhagic arthritis in the new-born is monoarticular or oligoarticular; the knee is almost constantly involved, much more frequently than with older children or adults. The general condition is little affected and fever is absent. Cure results without deformity in little more than a month. Another case of the kind, affecting the hip- and wrist-joints, has been recorded by Griffon.[4] A third case, of American origin, has been seen by Tyrrell.[5] Both wrist-joints became affected 4 days after the beginning of the ophthalmia.

INFECTIOUS DISEASES.

Coexistence of Infectious Diseases.—An unusual coincidence of infections has been seen by Hand[6] in a boy of 4 years: 4 days after the

[1] Arch. f. Kinderh., Bd. xiv. S. 65.
[2] Berl. klin. Woch., 1895, No. 23.
[3] Rev. mens. des Mal. de l'Enf., Oct., 1895, and La Méd. infantile, Dec., 1895.
[4] La Presse méd., No. 15, 1896.
[5] Med. News, Mar. 7, 1896.
[6] Arch. of Ped., May, 1896.

appearance of a profuse varicellar eruption diphtheric membrane was observed in the nostril, and 3 days later, after its prompt disappearance under antitoxin treatment, a profuse measles-rash appeared. This boy's brother, aged 7, who was suffering from diphtheria, and from whom the infection in the younger boy's case was received, entered upon a second attack of measles 10 days after his brother's attack and during his own convalescence from diphtheria. In the latter case it is interesting to observe that the diphtheria-bacillus continued to be present, but without membrane-formation, during the whole course of the catarrhal lesions of the measles. Whether this inactivity could be ascribed to the influence of antitoxin injections in the earlier treatment cannot be established, but under former modes of treatment a relapse of diphtheria might, with reason, have been expected.

Diphtheria.—Fränkel[1] replies to Hansemann's (see *Year-Book* for 1896, p. 539) objections against accepting the Klebs-Löffler bacillus as the essential etiologic factor in diphtheria. If, he argues, it is apparently not present in some cases of diphtheria, the inadequacy of our present methods are probably to blame. Its presence on healthy mucous membranes and elsewhere when there is no clinical diphtheria proves nothing against its etiologic significance in diphtheria, as individual predisposition must be taken into account. The conditions caused by animal-experimentation are, according to Hansemann, not diphtheria, but in Fränkel's opinion they bear a strong resemblance to human diphtheria. He believes that all of Hansemann's strictures on the Klebs-Löffler bacillus hold with equal force with regard to the tubercle-bacillus, the plasmodium of malaria, and many other organisms.

Pathology.—[Little that is new has appeared during the past year concerning the pathology of diphtheria, probably because our knowledge of this branch has been almost complete for some time.] The whole ground is thoroughly gone over by Councilman[2] and condensed into a series of conclusions admirably embodying our present knowledge of the subject.

Stokes[3] studied bacteriologically 9 fatal **cases of diphtheria in which antitoxin had been used,** and found in 8 of them a well-marked invasion of the blood by pyogenic cocci; in 5 cases the streptococcus was found in the liver, spleen, kidney, and blood of the heart, while the lungs were invaded with Löffler bacilli, streptococci, pneumococci, and staphylcocci pyogenes aurei, either alone or in various combinations.

Reiche[4] investigated **the kidneys** of 85 fatal cases before the antitoxin period, and found microscopic changes in the parenchyma, interstitial tissue, and Malpighian bodies. In the parenchyma there was cloudy swelling, followed by fatty degeneration, a few cases showing coagulation-necrosis. In 44 cases there was inflammatory proliferation of the interstitial connective tissue. The Malpighian bodies were always affected, but in varying degree.

Crocq[5] discusses the diphtheric **lesions of the nervous system** as

[1] Deutsch. med. Woch., Nov. 21, 1895.
[2] Boston M. and S. Jour., Sept. 5, 1895.
[3] Ibid., Dec. 12, 1895.
[4] Centralbl. f. innere Med., No. 50, 1895.
[5] Rev. mens. des Mal. de l'Enf., Sept., 1895.

experimentally produced in rabbits, in which a myelitis precedes the involvement of the nerves. Whether this occurs in man or not cannot be definitely determined, but it is probable that there are two types of diphtheric palsy, one being a localized neuritis and affecting the palate, pharynx, and larynx; the other, the generalized form, affecting the cord first and then the nerves.

Billings, Jr.,[1] has made a careful investigation of **the blood-corpuscles** in 36 cases of diphtheria, and studied the effect produced on them by the antitoxin. He also watched the effect of antitoxic serum on the blood of 15 healthy individuals. His conclusions are—1. The red corpuscles of the blood in diphtheria undergo a diminution in number in cases of moderate severity and in severe cases. Regeneration is slow. 2. The leukocytes are increased in number in all but two classes of cases, exceptionally mild cases and exceptionally severe ones. As a rule, the amount of leukocytosis is directly proportionate to the degree of severity of the case. The leukocyte-curve shows no correspondence to the clinical course of the disease. The number of leukocytes often remains higher than normal for days after all inflammatory phenomena have disappeared. The leukocytosis is similar in character to that seen in pneumonia and scarlet fever, the increase being in the so-called polynuclear forms. 3. The percentage of hemoglobin falls coincidently with the number of the red corpuscles, and to the same relative degree. But the regeneration of the hemoglobin takes place much more slowly than that of the red corpuscles. 4. In cases treated with antitoxin the diminution in number of the red corpuscles is much less marked than in those cases treated without it; in a majority of the cases no such diminution takes place. The leukocytes are apparently unaffected by the antitoxin. The hemoglobin is also much less affected in the cases treated with antitoxin, thus confirming the statement as to the red corpuscles. 5. In healthy individuals injected with antitoxin the red corpuscles show a very moderate reduction in number in about one-half the cases. The hemoglobin is correspondingly affected. The leukocytes are apparently unaffected by the injections. 6. No peculiar characteristic changes in the morphology of the corpuscles were to be made out. 7. It is improbable that any information of prognostic importance is to be gained by examination of the blood in diphtheria. 8. The antitoxin-treatment of diphtheria has no deleterious effects upon the blood-corpuscles. On the contrary, it seems to prevent degenerative changes which would otherwise be brought about.

Schlesinger[2] conducted similar studies in 24 children. In 21 of these cases, when examined before the injections, he found a manifest hyperleukocytosis, the degree of which varied between 1 to 71 and 1 to 275. This leukocytosis was not in relation with either the age of the child or the elevation of temperature present at the moment of examination; the influence of the gravity of the affection upon the leukocytosis was not constant, but in general the degree of hyperleukocytosis was more marked the graver the case. It was also observed that hyperleukocytosis diminished as the case proceeded to re-

[1] Med. Rec., Apr. 25, 1896.

[2] Arch. f. Kinderh., 1896, Bd. xix. S. 378.

covery, but persisted in the cases terminating in death. The influence of an injection of serum was manifested at first by a diminution of hyperleukocytosis, followed at the end of some time by an increase in the number of leukocytes, which did not always attain the degree observed before the injection.

Ewing,[1] working in the same field, arrived at essentially similar conclusions. He finds that the staining-reaction of the leukocytes is an accurate measure of the severity of the diphtheric infection, and variations in this reaction often precede changes in other symptoms. The multinuclear leukocytes found in the blood of favorable cases after treatment by antitoxin show increased affinity for gentian-violet. This change may be observed within 12 hours after the injection, and the failure of its occurrence is a very unfavorable prognostic sign. Antitoxin, within 30 minutes of its injection, causes a hypoleukocytosis, the reduction affecting specially the uninuclear leukocytes, while the proportion of well-stained multinuclear cells is increased. This action is due largely to the immunizing principle contained in the serum. He believes that the variations in the staining-reaction of leukocytes in diphtheria indicate that the nuclei of these cells contain a principle essential to phagocytosis and immunity in this disease.

An editorial in the Medical News of Feb. 1, 1896, suggests that the reason for **the tonsils** being the point of attack in 80% of all cases of diphtheria is that their situation is the most favorable for the microorganism to get a strong current of air, for it has been found that the germ develops rapidly under such conditions.

In examining **the blood-serum** of 14 children who, as far as known, had never had diphtheria, Orlowski[2] found that in a certain number the serum possessed the property of attenuating or even neutralizing the toxins of diphtheria, the degree of concentration of the immunizing substance being independent of the age of the child. In a note accompanying this paper Escherich adds that since these observations he had had the opportunity of observing a notable increase in the antitoxic power of the serum in one of these cases following a mild attack of diphtheria, and he therefore believes that the antitoxic power of the serum of individuals who have apparently never had diphtheria is attributable to the previous occurrence of a benign attack which had passed unperceived.

Diagnosis.—The diagnosis of diphtheria is discussed exhaustively by Hilbert[3] and by Williams.[4] Hilbert shows that while bacteriology extends the realm of diphtheria in one direction, it contracts it, although not to so great a degree, in another. The exclusion of the anginas not associated with the Löffler bacillus tends to raise the mortality of diphtheria, as the excluded cases present almost no mortality. Williams finds the bacteriologic examination of great value in two stages—very early in the disease, before the appearance of false membrane, and later, during convalescence.

[1] N. Y. Med. Jour., Aug. 10, 1895.
[2] Deutsch. med. Woch., 1895, No. 25.
[3] Deutsch. Arch. f. klin. Med., Mar. 26, 1896.
[4] Am. Jour. Med. Sci., July, 1895.

Klein[1] states that he has been unable to see any connection between the size of the bacilli and the severity of the disease, having found the short bacilli in both mild and severe cases, the same being true of the long form. He prefers agar-plates as culture-media, especially in those cases of mixed infection in which the bacilli may be swamped in a luxuriant growth of cocci. When other media are not obtainable, Wright and Semple[2] recommend the use of a small quantity of antitoxic serum or the white of an egg, introduced into a small bottle and sterilized and coagulated over steam.

Koplik[3] calls attention again to the possibility of acute lacunar **tonsillitis** being at times due to the Löffler bacillus, and urges the importance of bacteriologic investigation.

Prognosis.—Bernhard[4] points out the uselessness of basing the prognosis on the presence or absence of **albuminuria.** The severity of an attack depends upon the patient's predisposition and the virulence of the bacilli. The prognosis can be partially determined by the morphologic elements in the urine—casts, renal epithelium, leukocytes, etc. having a bad significance, the worse the earlier they appear.

Roeth[5] describes fully the characteristics of the **micrococcus Brisou,** and urges the importance, from a prognostic standpoint, of its recognition in cases of angina due either to the Löffler or to the pseudodiphtheria bacillus, since its presence invariably denotes a favorable termination.

Statistics.—Vital statistics of diphtheria for London from 1891 to 1895 have been compiled by Dixey,[6] and for Boston, New York, and Brooklyn from 1880 to 1895 by Coakley.[7] In answer to the charges that the improved rate of mortality in the Berlin hospitals was due to a larger number of mild cases being sent for admission, Behring[8] publishes a table showing that the proportion of hospital cases to the total number of diphtheria-cases in Berlin has grown steadily smaller since 1892. A second table shows that, coincident with an extensive use of antitoxin in Berlin, both the relative and absolute mortality have fallen, the one nearly to, and the other to less than, one-half that of any one of the past 5 years.

Antitoxin.—[That the antitoxin, in itself, is practically harmless may be considered as well established, in view of the countless number of injections that have been made, with but a few fatalities attributed to its use; and in these cases the evidence is either so complete as to clear the injection of all blame, or so incomplete as to allow of no positive deduction. The unpleasant effects, such as polymorphous eruptions, fever, and painful joints, are clearly due to the serum and not to the antitoxin, and, as more concentrated serums are being put on the market, these sequels may be confidently expected to grow less in number, since the quantity of serum to be injected will thus be lessened in amount. It is to be hoped that some practical method may soon be found

[1] Med. Press, Oct. 16, 1895.
[2] Brit. Med. Jour., p. 907, 1895.
[3] Jour. Am. Med. Assoc., Oct. 5, 1895.
[4] Arch. f. Kinderh., Bd. xix. S. 88.
[5] Boston M. and S. Jour., Jan. 23, 1896.
[6] Brit. Med. Jour., Aug. 31, 1895.
[7] Med. News, June 20, 1896.
[8] Deutsch. med. Woch., No. 38, 1895.

of obtaining the antitoxin apart from the serum, thus removing entirely the unpleasant effects due to the latter.] The nature of antitoxin is described, as clearly as is at present possible, by Klein.[1] He mentions as highly probable that the serum possesses two different actions, antitoxic and immunizing, which do not necessarily run on parallel lines, the serum prepared by injection of toxins possessing high antitoxic properties with relatively low immunizing power, while that obtained after injection of living cultures would be stronger for immunizing purposes. Bolton[2] has found **diphtheria-antitoxin in the blood of some horses** that had not been injected with the toxin, but the conditions determining this could not be ascertained. He has also corroborated Smirnow's work (see *Year-Book* for 1896), which showed that electrolysis is capable of producing antitoxin in the cultures of virulent diphtheria-bacilli. Smirnow[3] reports more extensively on his own work. Theobald Smith[4] discusses the conditions influencing the appearance of toxin in cultures of the bacilli.

Thomson[5] reviews the conditions and factors which enter into any reliable test of a remedy for an acute infectious disease. He shows that factors that would seem to prevent any conclusion being drawn are overcome by the mode and kind of evidence, and that the verdict, which is gradually being given from all parts of the world, is in favor of the antitoxin. He discusses the claim made by the opponents of antitoxin that the mortality everywhere should be lowered to a uniform rate if the antitoxin is to be considered at all a specific, and shows that this would require that antitoxin should be a body of definite composition and properties like a chemical compound, and that diphtheria should have equally unvarying characters everywhere. A specific in this sense of the term does not exist.

Welch[6] gives a **summary of all reported cases down to July, 1895,** covering 7166 cases treated mainly in hospitals, with a mortality of 1239, or 17.3%; 4294 of the cases were laryngeal, and gave a total mortality of 18.3%; 1167 of these came to operation (intubation or tracheotomy), and 434 died, a mortality of 37.2%, while 3127 not operated upon gave a mortality of 11.2%. Heubner,[7] in reporting 117 additional cases with a mortality of 10.2%, quoted official statistics which show that the mortality from diphtheria in Berlin, Dresden, Leipsic, Munich, and Hamburg for the first half of 1895 is both absolutely and relatively much lower than during any year covered by the records, although for Berlin the total number of cases was much larger. Monod,[8] investigating the mortality from diphtheria in over 100 large towns in France, found that the average number of deaths from diphtheria in each town for the first 6 months of each year from 1888 to 1894 was 2627. The corresponding number for 1895 was 904, showing an apparent saving in those 6 months of 15,000 lives. "Although," as suggested

[1] Brit. Med. Jour., Aug. 17, 1895.
[2] Med. Rec., May 9, 1896.
[3] Berl. klin. Woch., July 29, 1895.
[4] Med. Rec. May 9, 1896.
[5] Ibid., June 20, 1896.
[6] Bull. Johns Hopkins Hosp., July–Aug., 1895.
[7] Deutsch. med. Woch. No. 42, 1895.
[8] Ref. in Boston M. and S. Jour., Jan. 23, 1896.

in the *Lancet*, "climatic conditions or other unknown causes may have influenced this result to some extent, it seems unreasonable not to attribute this great diminution, which has gone on synchronously with the use of the antitoxic serum, in a large measure to the action of that remedy."

The Committee of the American Pediatric Society (Holt, Northrup, O'Dwyer, and Adams)[1] appointed to collect statistics of the use of **antitoxin in private practice** received reports from 615 physicians scattered in all parts of the U. S. and Canada. The committee in its reports excluded all doubtful cases that recovered, but included all doubtful cases that died. No new cases of sudden death immediately after the injection were returned, and but 19 cases seemed to be uninfluenced favorably by the injections, 9 of these being of doubtful diagnosis; 4 were complicated with measles; 3 were malignant cases; and in 2 the serum was of uncertain strength and of doubtful value; 3 cases were reported by the observers as being made worse by the injections. In all, 5974 cases were reported with a general mortality of 12.3%; moribund cases, or those dying within 24 hours of the injection, being excluded, it was 8.8%; 4120 cases injected in the first 3 days gave a mortality of 7.3%, or 4.8% if the moribund cases and those dying within 24 hours of injection are excluded. The mortality of 1448 cases injected on or after the fourth day was 27%. "The most convincing argument and, to the minds of the committee, an absolutely unanswerable one, in favor of serum-therapy is found in the results obtained in the 1256 laryngeal cases." In one-half recovery occurred without operation. Of the 533 intubated cases, the mortality was 25.9%. Bronchopneumonia occurred in 5.9%, in striking contrast to the proportion arising in hospitals. In a large number the heart's action was improved after the injection. There is very little, if any, evidence to show that the serum caused nephritis, but 15 cases in all dying from genuine nephritis. Paralytic sequelæ arose in 9.7%, showing that the serum has less effect on the nervous system than on any other part of the body. The society adopted the report and embodied its conclusions in the following resolutions: 1. *Dosage.*—For a child over 2 years old the dosage of antitoxin should be, in all laryngeal cases with stenosis and in all other severe cases, 1500 to 2000 units for the first injection, to be repeated in from 18 to 24 hours if there is no improvement; a third dose after a similar interval if necessary. For severe cases in children under 2 years and for mild cases over that age the initial dose should be 1000 units, to be repeated as above if necessary; a second dose is not usually required. The dosage should always be estimated in antitoxin units, and not by the amount of the serum. 2. *Quality of Antitoxin.*—The most concentrated strength of an absolutely reliable preparation. 3. *Time of Administration.*—Antitoxin should be administered as early as possible on a clinical diagnosis, not waiting for a bacteriological culture. However late the first observation is made, an injection should be given unless the progress of the case is favorable and satisfactory.

Adams[2] has compiled statistics from the District of Columbia, and finds

[1] Arch. of Ped., July, 1896. [2] Ibid.

that for the year ending June 30, 1894, there were 432 cases and 172 deaths, 39.8%. During the next 15½ months there were 311 cases, with 73 deaths, 23.44%. Of these, 135 were treated without antitoxin, with 47 deaths, 34.8%; the remaining 176 cases received antitoxin, 26 dying, 14.7%. The report is very thorough, giving careful analyses of age, race, kind of antitoxin, location of membrane, complications, and additional treatment.

A valuable treatise upon the serum-treatment of diphtheria is that embodying the observation of Baginsky at the K. und K. Friedrich Kinderkrankenhaus, Berlin, from March 15, 1894, to March 15, 1895.[1] The cases observed numbered 525, and the mortality, which was due entirely to 55 out of 192 light cases of general infection and 26 out of 30 septic cases, reached only 15% of the total number, or 36% of the serious cases in the two classes enumerated. A later report[2] adds the statistics of 203 subsequent cases with 21 deaths, 9.37%. A table[3] analyzes 6626 cases of diphtheria treated with antitoxin by 1349 physicians in different parts of the German Empire. It is of interest to note that 87% recovered, and in only 13% was benefit not observed after the injections. Washbourn[4] says that the majority of observers are agreed that the exudation clears off more rapidly with antitoxin than with any other method of treatment; that the temperature in diphtheria being of little importance as indicating the severity of the disease, the effect of the antitoxin is not of great moment, but if the fever is high it usually subsides rapidly; that there are no direct effects on the heart and kidneys, both, however, sharing in the general improvement; that if postdiphtheric paralysis appears more frequently, it is probably due to a survival of a greater number of severe cases; and that the antitoxin does not neutralize the effects of the invasion by streptococci or other bacteria. Gayton[5] does not think that the antitoxin can be credited with the lower rate of mortality, as it is not uniform everywhere. [This argument has been satisfactorily answered by Thomson[6] in another place.] Caiger[7] comes to rather different conclusions, finding from the use of antitoxin a lower mortality, a more rapid separation of the membrane, a relief from laryngeal and nasal obstruction, and, in those cases destined to die, a prolongation of life and greater comfort than usually obtains.

The Metropolitan Asylums Board of London reported[8] on the use of antitoxin in 2182 cases with 615 deaths, 28.1%. This is only slightly better than the figures for 1894, but the good effect of the antitoxin was most marked in laryngeal and tracheotomy cases, the rate of mortality falling respectively 20.2 and 21.2%.

In an article entitled "Clinical Observations on the Use of Antitoxin in Diphtheria, and a report of a personal investigation of this treatment in the principal fever hospitals of Europe during the summer of 1895,"[9] Winters

[1] Berlin, Aug., 1895, Kirschwald.
[2] Berl. klin. Woch., Sept. 16, 1895.
[3] Ibid., Oct. 28, 1895.
[4] Brit. Med. Jour., Aug. 17, 1895.
[5] Ibid.
[6] Med. Rec., June 20, 1896.
[7] Brit. Med. Jour., Aug. 17, 1895.
[8] Ref. in Med. Rec., May 2, 1896.
[9] Med. Rec., June 20, 1896.

continues his opposition to the antitoxin, seeing not only no good in it, but positive harm. [If, as he says, the antitoxin does harm, and if the present low death-rate is due to the mildness of diphtheria, then the antitoxin must be holding up the death-rate to a certain extent, which would make it seem, then, that diphtheria at present should have an insignificant mortality if the use of antitoxin were to be abandoned.] Branman[1] replies to Winters [both are attending physicians to the Willard Parker Hospital, N. Y.], correcting a number of statements as to clinical histories, medication, etc. The fatal cases in which postmortems were allowed were found to show pathologic changes not different from those formerly ascribed to diphtheria. White[2] gives as one reason why Winters saw no improvement in the cases at the Willard Parker Hospital that the improvement had already taken place, the patients having been admitted and injected from 12 to 24 hours before seen by Winters. Wesener,[3] having treated 100 hospital cases, concludes that antitoxin does neither more nor less in simple pharyngeal diphtheria than the usual local treatment; that it acts a little better in preventing a spread to the larynx or the need for tracheotomy if the larynx should be involved; that it is of no avail if the trachea or bronchi are involved; that it does not act any better in preventing or relieving sepsis; that its immunizing properties are not well established; that it is harmless. Furth[4] also treated 100 hospital cases, and concludes that nothing can equal antitoxin in its specific action. In private practice Schell[5] finds a remarkable improvement in the general condition of the patient shortly after its use. This improvement extends to all features of the case, including the pulse, so that some fellow-practitioners "who deny its value as a remedy for diphtheria insist upon its use as a cardiac stimulant." This is rather against the experience of Engel in Cairo,[6] who found a general depression with weakening of the heart for a short time after the injection. The general mortality of the antitoxin cases in Cairo (48 cases, 18 deaths, 37.5%), while higher than elsewhere, is yet lower than that which formerly held there.

Taking the statistics as a whole, Dana[7] finds that the percentage of palsies following diphtheria treated by antitoxin is somewhat lower than that which prevailed formerly, though there are some striking exceptions to this, and, apart from the figures, the general opinion is that the antitoxin does not lessen the frequency of these palsies. He further states that the fact that **diphtheric palsies** are not very much affected or not stopped "shows that the antitoxin, however effective as a whole, is not given in sufficient doses to prevent the specific effect of the diphtheria on the nervous system. The absolute and final test of the specific character of the diphtheria-bacillus, according to Dr. Sidney Martin, is, that it has the power to produce a poison which causes degeneration of the nerves and nerve-cells. He asserts that injections of either

[1] Med. Rec., June 20, 1896.
[2] Brooklyn Med. Jour., x. No. 2.
[3] Münch. med. Woch., Sept. 10, 1895.
[4] Ibid., July 23, 1895.
[5] N. Y. Med. Jour., Apr. 18, 1896.
[6] Berl. klin. Woch., Sept. 16, 1895.
[7] Med. Rec., Apr. 11, 1896.

the diphtheric albumose or of the toxin obtained from the membrane will cause these degenerative changes when injected into animals. He asserts, furthermore, that the injection of the antitoxin does not cause these changes; and, third, he asserts that when animals have received injections of diphtheric toxins, and then of antitoxin, the nerves are not affected. The fact, therefore, that persons who suffer from diphtheria and who receive antitoxin injections still develop postdiphtheric paralysis, shows at least that the antidotal action of antitoxin is not complete. It would not be fair to say anything more, and it may well be said that though this antidotal action is not complete, so far as the nerve-centers are concerned, it is sufficient in a large number of cases to prevent serious destruction of the organism.

Immunization.—Biggs[1] reports on the use of antitoxin in different institutions of New York for immunizing purposes, the appended table showing the almost wonderful results:

	No. of cases immunized.	No. of units of antitoxin administered.	No. of cases of diphtheria developing among those immunized between 1 and 30 days.	No. of cases of diphtheria developing within 24 hours.	No. of cases of diphtheria developing after 30 days.	No. of cases of diphtheria that occurred in the institutions previous to immunization.
New York Infant Asylum (1st immunization)	224	100 to 200	1 mild on the 19th day.	. .	6	107 cases in 108 days.
New York Infant Asylum (2d immunization)	245	125 to 225	1 mild on the 12th day.	. .	4	6 cases in 12 days.
Nursery and Child's Hospital	136	50 to 200	. . . .	. .	. .	46 cases in 90 days. 15 cases in 15 days.
New York Juvenile Asylum	81	150 to 250	. . . .	. .	. .	12 cases; 3 cases in 2 days.
New York Catholic Protectory	114	150 to 600	. . . .	1	. .	5 cases in 3 days.
Bellevue Hospital	11	175 to 225	. . . .	. .	. .	2 cases in 10 days.
Health Department Inspectors	232	150 to 250	1 mild on the 19th day.	3	3 (1 : 30, 1 : 31, 1 : 55)	1 or more cases in more than 90 families.
Total	1043	. . . .	3	4	13	

Morrill[2] shows how immunizing injections of antitoxin obviated the necessity of closing the Boston Children's Hospital in the early part of 1895, a contingency which had arisen 3 times in 1894.

Eruptions and Accidents following Antitoxin.—Seibert and Schwyzer[3] experimented on animals to determine the **cause of the sudden deaths** reported after injections of antitoxin, and conclude that neither the antitoxic serum nor the phenol was responsible, but that air must have entered the venous circulation at the time of injection. The cases of Prof. Langerhans' child and Miss Valentine (mentioned in the *Year-Book* for 1896) are fully reported, the former by Strassmann,[4] the latter by Kortright.[5] Moizard and Bouchard[6] report a case of angina in which the Löffler bacillus could

[1] Med. News, Nov. 30, 1895.
[2] Boston M. and S. Jour., June 27, 1895.
[3] N. Y. Med. Jour., May 30, 1896.
[4] Berl. klin. Woch., June 8, 1896.
[5] Brooklyn Med. Jour., Feb., 1896.
[6] Ref. in La Méd. infant., Dec. 15, 1895.

not be found. Antitoxin was given and the throat was clear in 3 days. After 3 days more, vomiting, diarrhea, and fever set in, and the case terminated fatally 4 days later with convulsions, strabismus, dilated pupils, and coma—a result which Moizard attributed to the antitoxin, although it does not seem[1] to have caused him to oppose the use of antitoxin in diphtheria. Roux[2] criticises this report severely, as drawing conclusions on insufficient premises, and asserts that the harmlessness of antitoxin is shown by the fact that over 100,000 injections of the same serum had been made in France, in some cases much larger amounts being used than in the case reported. He says: "The serum may cause transient eruptions, but it is not dangerous, it does not kill. When you meet a case of angina with false membrane, make a culture, but do not await the result; 24 hours lost may mean a life sacrificed. Inject at once 10 c.c. of serum in ordinary cases, and 20 c.c. if it be severe or involve the larynx. You may then await the decision of the bacteriologist; your precautions have been taken in time. In the initial period the serum is marvellously effective. If the patient has not diphtheria, rest assured that you have in no wise compromised his welfare."

Dubreuilh[3] and Moussous[4] have discussed the postserotherapic eruptions. The former found that in some instances these followed the injections of serum from nonimmunized animals, that from dogs, sheep, or cattle causing them less often than from horses, mules, or asses. Moussous described 4 types: 1. A general or localized erythema like the eruption of measles, but without the other associated symptoms of coryza, etc. 2. An erythema like that of scarlatina, diffuse or in plaques, but lacking the phenomena of sore throat, etc. 3. A nettle-rash erythema. 4. A petechial erythema.

Additional Treatment.—Seibert[5] mentions the value of **antipyrin,** as first pointed out by Schweiger,[6] in cases of recurring dyspnea after extubation. **Pilocarpin** as a valuable adjunct to antitoxin, especially in septic cases, is urged by Sziklai,[7] Barsky,[8] and Saunders.[9] [A very complete series of abstracts of the literature of the diphtheria antitoxin, covering the years 1894 and 1895, will be found in the Jahrbuch f. Kinderheilkunde, Bd. xli., embracing nearly 100 pages of that publication.]

Measles.—Moslay and Jolly[10] report 4 cases of measles complicated with a **diarrhea** characterized by mucous and bloody stools; all 4 children died with bronchopneumonia. At the autopsy, besides the pulmonary lesions which seemed to have been the immediate cause of death, there were found ulcerations of the sigmoid flexure and rectum analogous to those of a true dysentery, but with small follicular ulcers that extended even to the small intestine and, in the most aggravated case, far up in the small gut. Rilliet

[1] Ref. in Rev. prat. d'Obst. et de Pædiat., July, 1895.
[2] Lyon méd., p. 479, 1895.
[3] Rev. prat. d'Obstét. et de Pædiat., Aug., 1895.
[4] Rev. mens. des Mal. de l'Enf., Oct., 1895.
[5] N. Y. Polyclinic, July 15, 1895.
[6] Jahrb. f. Kinderheilk., Aug., 1893.
[7] Progrès méd., Sept. 21, 1895.
[8] Sem. méd., 1896, No. 4.
[9] Va. Med. Monthly, Mar., 1896.
[10] Rev. mens. des Mal. de l'Enf., Aug., 1895.

and Barthez have described a form of dysenteric diarrhea occurring under their observation twice after measles and 4 times after variola, but in none did the ulceration compare with that in one of the cases here recorded. Bolognini [1] describes what he considers an early sign of measles depending upon a sort of **peritoneal enanthem.** The child must be quiet and submit passively to examination, lying upon his back with thighs flexed. Standing by the side of the patient, the physician places his hands upon the abdomen, slowly and with gradually increasing pressure palpating the whole surface. There will be felt a fremitus or sensation of friction, not equally generalized, but distributed here and there over the abdomen, of fugitive character and difficult to detect. The author has sought for this phenomenon in 200 children, and has found it in all except 2 cases. The same exploration made in healthy children or in those not infected with measles has always been negative. He thinks the sensation is due to a slight alteration in the peritoneum, which he attributes to an internal eruption.

Bezold [2] has repeated the investigations of Tobeitz upon the **frequency of otitis in measles,** and concludes with this observer that otitis is a constant accompaniment of the disease. This conclusion is based upon an exploration of the contents of the tympanic cavity in a large number of rubeolous patients and upon a study of 16 specimens obtained from fatal cases. In the latter series mucopurulent, seropurulent, or purulent effusion was found in the tympanic cavity, antrum, and in the mastoid cells where these were sufficiently developed. Streptococci were found in half the cases, and white or golden staphylococci in the other half. The same organisms were found in about the same frequency in the exudate obtained by puncture of the drum in cases that recovered. This otitis begins early and is well marked on the 3d or 4th day after the eruption appears. Its course is benign, generally without marked symptoms; perforation is exceptional. As to the pathogeny, the author rejects the theory of infection through the Eustachian tube, but regards this otitis as a localization of the virus upon the mucous membrane of the ear, similar to that observed in the conjunctiva, bronchi, and intestine.

Scarlatina.—One of the topics for special discussion at the annual meeting of the American Pediatric Society in 1895 was scarlatina, and a number of interesting papers were presented. Attention may be drawn to the paper of Blackader [3] on "Some Forms of **Eruption Simulating Scarlatina,**" and the discussion elicited by it, which was opened by Dr. Griffith. This last-named observer covers nearly the same ground in a later paper on the same subject.[4] Louis Starr [5] reported a series of 6 cases, scarlatinal in character, the first presenting an intense but anomalous rash, without additional symptoms, followed by 3 other cases of similar eruption, each one adding a few details to the classic picture, until finally 2 cases occurring in the family of one of these patients stamped the series with the unmistakable diagnosis

[1] La Pediatria, Apr., 1895.
[2] Münch. med. Woch., Nos. 11, 12, 1896.
[3] Arch. of Ped., Sept., 1895.
[4] Med. News, Aug. 31, 1895.
[5] Arch. of Ped., Sept., 1895.

of scarlet fever. Cases I. and II. occurred in the same family, 1 being taken ill 7 days after the other. Cases III., V., and VI. were also children of one family, 2 having been infected from the doubtful case. The rash in the first 4 cases presented many points of resemblance, the eruption being erythematous, punctate in places, and of a reddish-purple tint in some regions. Maculopapules were found as the rash extended. The desquamation was distinctly scarlatinal in type. In Cases I. and II. the temperature showed little deviation, reaching only 99° on the 3d day in the first, and ranging from 98.2° to 100° F. from the 1st to the 11th day in Case II.; the pulse was not above 90 at any time in either case. In Case III. vomiting occurred at the onset and temperature rose to 100° F. for one day. In Case IV. nephritic symptoms appeared during convalescence. Cases V. and VI. were attended with moderate elevation of temperature and increased pulse-rate for several days, and were distinctly scarlatinal in character. [These cases form an interesting series and demonstrate how difficult diagnosis may be in the milder cases.]

Wilson[1] saw in consultation a case of superficial **gangrene** of somewhat symmetrical distribution occurring 3 weeks after the onset of an attack of scarlet fever, and after apparent convalescence had become established. An irregularly symmetrical area of bluish-black discoloration of the skin occupied the nose nearly to its tip, and spread for 1 in. to the right and 1½ in. to the left side of the face. An area of similar discoloration, larger in size, also irregularly symmetrical, about 3 by 5 in. in diameter, occupied the renal region, extending down toward the buttocks. Epistaxis, continuing till death, 18 hours later, had begun just before the discoloration of the nose had shown itself. Symptoms of acute nephritis, followed for a time by almost complete suppression, had occurred 3 days before the gangrenous process had become manifest. No studies of the blood were possible. The case is very similar to 1 reported by Davies,[2] occurring 3 weeks after an attack of scarlatina. Secondary infection is suggested as a probable explanation.

From a study of two epidemics of scarlatina among soldiers in barracks Vogl[3] concludes that while **contagion** through a third person or through fomites or desquamation undoubtedly is efficient in spreading the disease, of greater importance in this respect is direct contact with the patient during the 3 to 5 days of the incubation-period. Lemoine[4] is of the opinion, which is shared by LeGendre and Sevestre, that the contagion of scarlatina is elaborated from the beginning of the affection, and, starting from what is its ordinary port of entry, the pharynx, spreads itself upon the cutaneous surface, the clothing, and surrounding objects. He believes that too much attention is paid to the disinfection of the skin, and not enough to that of the mouth, where, because of insufficient disinfection, the contagious principle may linger for a long time. He advises that antiseptic irrigation of the pharynx be kept up for some time after the disappearance of the angina.

[1] Arch. of Ped., Sept., 1895.

[2] Brit. Med. Jour., Feb. 28, 1891.

[3] Münch. med. Woch., Nos. 41 and 42, 1895.

[4] Rev. prat. d'Obstét. et de Péd., Nov.-Dec., 1895.

A. Griffith[1] considers the occurrence of **secondary rashes in scarlet fever** in a paper based on his experience in the Bagthorpe Fever Hospital, Nottingham. Out of 2000 cases admitted for scarlet fever, there were 14 that suffered from what were considered as second attacks of the fever. If the author's view is to be accepted, and these later rashes are to be explained as indicated (agreeing with the experience of other large isolation hospitals), the question arises whether the illness is due to autoinfection, being properly termed a "relapse" or "recrudescence," or whether it depends on the presence of other patients in the same ward, some of whom may have fever of a more virulent character. It is not difficult to imagine that in a ward containing 12 to 20 patients, even with 2000 cubic feet of air-space each, the amount of infection is very large, the virulence being possibly increased by aggregation as well as by the uniform temperature of 60° F.; nor is it difficult to suppose that those who have had mild attacks from a small dose of poison in the first place, rather than from their insusceptibility, may be insufficiently protected against a larger dose of a more virulent infection. If this is the correct explanation, it would point to the inadvisability of aggregating fever cases in large wards, and still more to the fault of the usual plan of placing mild and medium, if not severe, cases in the same wards and under the same nurses.

A careful investigation of the conditions under which **"return" cases of scarlatina** may appear has been lately made by Chalmers[2] from the statistics of the three fever hospitals of Glasgow. During 1894, 2593 patients were sent to their homes after an attack of scarlet fever, and in 70 of the houses fresh cases of the disease appeared. In 93% of these cases the new infection appeared within 2 weeks after the convalescent's return; in 19% it seemed to depend upon the recurrence of desquamation or of discharge from the nose or ear in the original patient. In the remaining cases no such cause was found, so that it seems probable that the returned patient may remain infective, although he is entirely free from desquamation and shows no trace of the disease. There appears to be some evidence of the connection of this latent infectivity with the amount of air-space allotted to each patient in the ward, there being apparently a greater tendency to the communication of secondary infection when the original patient has been treated in an overcrowded ward. Whether this infective power lies in the breath or in the skin, the practical conclusion is adduced that a patient should be isolated from other children for some time after his return from the hospital.

Considerable interest has been aroused by the experimental use of **Marmorek's antistreptococcic serum in scarlatina.** While the pathogenic germ of this disease is not definitely known, it has been generally accepted that a streptococcus is encountered in all cases, and this fact has suggested to Josias[3] the employment of the serum as a prophylactic against the more serious secondary complications. His earlier experiments were made upon 49 cases with a small dose of a serum derived from sheep. No phenomena but a slight

[1] Quart. Med. Jour., Oct., 1895.

[2] Lancet, June 22, 1895.

[3] Tribune méd., Sept., 1895.

urticaria in a number of cases occurred after several days. The course of the disease seemed in no way modified, and implication of the cervical glands and of the kidneys was not prevented. Later[1] a more active serum from the horse was tried in a second series of 96 cases. Ten c.cm. of this serum were given at admission, and the injections repeated according to persistence of fever, exudation, or albuminuria. Without entering into an analysis of the results, we can briefly state that they have been disappointing. In the first series, as compared with the results in 365 cases treated according to the usual methods, the mortality was noticeably less (5.81% to 2.08%), while in the second series it was practically the same. Josias believes that no advantage over the older methods has been demonstrated; that neither the course nor temperature-range has been affected; and that no influence upon the diverse suppurative processes liable to occur during the course of the disease has been observed. He finds it difficult to explain why the streptococcic complications of scarlatina seem to be so little affected by Marmorek's serum, which experience has shown to be so marvellously efficacious against most streptococcic affections. He suggests a possible explanation in a curious observation recently reported by Méry,[2] who found in the blood of a scarlatinous child a streptococcus upon which Marmorek's serum had absolutely no effect. If, in addition, it be remembered that researches in Nocard's laboratory have shown the existence of two infectious streptococcic diseases in the horse, one of which is absolutely refractory to the action of Marmorek's serum, while the other is prevented by the injection of a small dose of this agent, the conclusion is at once almost irresistible that the streptococcic complications of scarlatina are due to a special variety of the organism altogether different from the streptococcus of erysipelas, and against which the serum of Marmorek is powerless.

Baginsky's[3] experience, however, is apparently more encouraging, though the test cannot be regarded as conclusive, since the quantity of serum available was small and required economical use; 48 cases were treated with a mortality of 7, or 14.6%. This compares more than favorably with the mortality of 238 cases of the same epidemic treated in the K.- und K.-Friedrich Kinderkrankenhaus in 1895, which equalled 24.9%; from 1890 to 1894, inclusive, the yearly mortality varied from 22.6 to 34.4%. Local infiltration about the point of injection sometimes occurred, and urticaria in several of the cases.

In 33 uncomplicated cases Lemoine[4] found no **streptococci** in the blood during any stage of the disease. In 2 hemorrhagic cases, however, 1 of which was fatal at the end of 48 hours, the other after 5 days, blood from the margins of sanguineous effusions gave pure cultures of a streptococcus. As in the researches of D'Espine and Marignac, this streptococcus coagulated milk and flourished on potato. From these facts Lemoine argues that the presence of the streptococcus in the blood is accidental and due to complications of the disease. Of 22 cases of nephritis, this streptococcus was found in the urine of all, the angina having been of grave character; while of 11 cases in which

[1] La Méd. mod., May 16, 1896.
[2] Soc. de Biol., Apr. 18, 1896.
[3] Berl. klin. Woch., Apr. 20, 1896.
[4] Soc. méd. des Hôp., Mar. 20, 1896.

the urine remained normal, the streptococcus was found in but 1. He therefore regards the renal complication as a secondary infection, most often the result of special virulence of the streptococcus developed in the fauces.

Excessively high temperature in the course of this disease has been observed by Depasse[1] in a child of 16 months. On the 12th day a temperature of $107\frac{3}{5}°$ F. was recorded, and was maintained for 70 hours, despite active antipyretic treatment by means of antipyrin and frequent cold baths.

Dauban[2] cites a remarkable observation of Péron in which a **scarlatinal arthritis** was immediately **followed by** a well-characterized progressive **chronic rheumatism.** The scarlatina had occurred at the age of 12 years, and, when examined at the age of 23, the patient presented a large number of deformities affecting principally the upper extremities. The lesions, however, were not exactly the same as in a true nodose rheumatism, since the synovial membranes of the joints and the fibrous tissues surrounding them were alone affected, and considerable benefit from treatment was obtained.

Priestly[3] details the results of his investigation of the use of **eucalyptus oil** as a disinfectant in scarlet fever—a method of treatment originally proposed and enthusiastically advocated by Curvengen of Teddington. The treatment consists in carefully rubbing the whole body 3 times a day for 3 days with a mixture composed of the oil of eucalyptus, thymol, camphor, and other aromatic disinfectants in solution. After 3 days one rubbing each day is given after a warm bath. The results reported by the author are extremely good. Cases treated in the hospital are discharged 1 week earlier than ordinary cases, desquamation being distinctly hastened by its use. Seibert[4] has found that inunctions of a 5% ointment of **ichthyol** have been followed by most marked effect upon the local condition of the skin, producing rapid decline of fever and improving the general condition. The swollen, red skin shrinks and turns pale brown, temperature declines 3 to 4 degrees within 2 hours, and the nervous, itching, peevish child becomes quiet and usually goes to sleep. While he does not believe that the treatment has any specific effect upon the character of the general infection in scarlatina, so as to change a malignant case into a mild one, he is convinced that the ointment applied in these cases destroys most of the bacteria causing scarlatinous dermatitis, and thereby materially aids in overcoming the general infection.

Typhoid Fever.—[The occurrence of typhoid fever **in young children** has been discussed considerably in the past 2 years, and the general testimony has been that the disease is extremely rare during the first 2 years of life and uncommon under 3 years.] Strong evidence in support of this view has been brought forward by Northrup,[5] who quotes the statistics from the New York Foundling Hospital, the New York Infant Asylum, and the Philadelphia Children's Hospital. During the past 20 years at the New York Foundling Hospital, where 1100 of the 1800 children under its care

[1] Rev. mens. des Mal. de l'Enf., June, 1896.
[2] Thèse de Paris, 1895.
[3] Jour. Am. Med. Assoc., vol. xxiv. No. 18, 1895.
[4] Arch. of Ped., Sept., 1895.
[5] Ibid., Dec., 1895.

are boarded out in the city and surrounding country, being returned to the hospital when ill, not a single case has been seen by Drs. Northrup, O'Dwyer, and J. Lewis Smith, as confirmed by the 2000 autopsies of Dr. Northrup.

In **the Stamford, Connecticut, epidemic** of May, 1895, which was due to an infected milk-supply, 406 cases of all ages occurred, 194 in children under 15 years and 68 under 5 years. Of this number, 4 cases in infants, aged respectively 13 months, 22 months, 16 months, and 22 months, are recorded by Northrup[1] in a later paper, together with 3 other cases aged 27 months, 30 months, and 3 years. These 4 cases under 2 years of age were the only ones recorded out of the total of 406, and not only go to bear out the fact of insusceptibility at an age when other intestinal diseases are very frequent, but also show that, as Northrup states, this insusceptibility is only "overcome by the overwhelming poison present in a severe epidemic." All of the 7 cases here referred to had been exposed directly to the infection by drinking the milk, and in some instances by being in intimate relation with others sick of the disease. In this same paper Northrup calls attention to an important point in the morbid anatomy in young children by presenting side by side the specimens from the only fatal one of these cases and the ileum of another child dying in convulsions after an illness of only 36 to 48 hours. In the latter case there was a history of gross error in diet, and typhoid fever could not have been considered. In the fatal typhoid case only two of Peyer's patches at the lowest part of the ileum were prominently swollen, with moderate swelling of the solitary follicles higher up in the ileum and in the colon. In the case of acute indigestion the swelling of Peyer's patches and the mesenteric glands was much more noticeable, though the appearances were far from being as pronounced as in other similar cases that had been observed by the author. These postmortem findings, he says, in the absence of a clear clinical history, must not be interpreted like similar lesions in the adult. He refers to a more striking illustration in Rotch's recently published text-book.[2] He concludes that in the young child typhoid appears under the same guise as in the adult, and that the characteristic eruption is one of the most valuable points toward a diagnosis; and as a parting warning he says: "Beware of typhoid without lesions and lesions without clinical history of typhoid."

A house-epidemic affecting 11 children between the ages of 3 and 12 years is described by Bond.[3] He believes that care should be used to prevent accumulations of ill-digested, foul, and irritating food-residues in the bowel at any time from the inception of the disease far into convalescence. At the beginning the bowels should be thoroughly cleaned out. Later, if there is not depressing diarrhœa, he does not hesitate to give occasional $\frac{1}{10}$-gr. doses of calomel or, if constipation be present, small doses of Epsom salts (℥ss to ℥j) to secure a daily evacuation. The results of this plan of keeping the bowels open are stated to have been very favorable. [General teaching, however,

[1] Arch. of Ped., Jan., 1896.

[2] Pediatrics, Philadelphia, 1896.

[3] Va. Med. Monthly, Jan., 1896.

has been against the use of purgatives except at the very onset, lest perforation at the site of deep ulcers be induced by the increased peristalsis.]

By far the most **extensive series of cases** of typhoid fever in children reported by one observer in recent years is that drawn from the records of the Boston City Hospital by Morse;[1] 284 cases are analyzed, including, under 5 years, 3 cases; from 5 to 10 years, 77 cases; and from 10 to 15 years, 204 cases. The insignificant number of young children, as compared with that given in Vogel's 1017 cases and in the 686 combined cases of Henoch, Roeth, Earle, Archanbault, Smidt, and Wolberg, is explainable by the fact that small children are rarely taken at the hospital. While this to some extent diminishes the value of the proportions at other ages, the general conclusions which draw a contrast with adult cases are not affected.

Noyes[2] again emphasizes the fact that in early infancy typhoid fever in a typical form is **rare in this country,** though not uncommon abroad. It is in a mild or abortive form that it must be looked for here if we wish to separate it from other intestinal or meningeal diseases that may appear. He points to the significance of Vincent's[3] studies of the later and secondary condition of infection by a combination of Eberth bacilli and streptococci, and concludes that when a case is severe and prolonged we may see in it not the result of the simple infection by the typhoid-bacilli, but a complication by other pathogenic bacteria.

Freund and Levy[4] have observed an interesting example of **intrauterine infection.** The mother aborted about the sixth month of pregnancy during the fourth week of typhoid fever. The delivery was conducted under strict antiseptic precautions for the purpose of submitting the fetus to a thorough bacteriologic examination, which was begun 20 minutes after birth, the fetus having died 15 minutes after the cord was cut. Cultures were taken from the placenta, the pulp of the spleen, and the blood from the heart, and in all three the bacillus of Eberth was found. Cultures from the superficial parts of the placenta and from the vernix caseosa remained sterile, thus excluding the possibility of accidental infection. The anatomic lesions of the fetus were confined to a slight hypertrophy of the spleen, which appeared a little softer than in the normal state. The patches of Peyer were not ulcerated and the intestinal mucous membrane was normal. The absence of specific lesions, which is a condition common to all cases of intrauterine infections, is attributed by the author to two facts—to the septicemic form which all such intrauterine affections exhibit, and to the absence of functional work in the special organ which in the adult the microorganism chiefly attacks.

König of Pittsburg[5] speaks highly of **guaiacol** internally as an antiseptic in the typhoid fever of children. He employs the following formula: ℞. Guaiacol, f℥j; glycerin, f℥ij; alcohol, f℥ij.—M. Sig. 1 to 6 drops in whisky and water every 2 hours, according to the age. This treatment is

[1] Boston M. and S. Jour., Feb. 27, 1896.
[2] Jour. Am. Med. Assoc., Sept. 28, 1895.
[3] Ann. de l'Inst. Pasteur, 1893.
[4] Berl. klin. Woch., No. 25, 1895.
[5] Jour. Am. Med. Assoc., Oct. 5, 1895.

continued throughout the course of the disease, the dose of guaiacol being increased or decreased according to the severity of the symptoms. He states that under this plan of treatment intestinal antisepsis is evidenced by the slight degree of tympanites, absence of sordes, and especially by the character of the stools, which are much less frequent and practically destitute of the very disagreeable odor that characterized the passages of patients before the introduction of treatment directed toward intestinal antisepsis.

Varicella.—Semtschenko[1] publishes a **study of 872 cases** of varicella observed in 12 epidemics during 15 years at the Hospice des Enfants-assistés in Kasan. In all the cases the existence of a period of incubation was observed, varying from 3 to 26 days, the average observed in the largest number of cases being 16. The period of incubation passed ordinarily without symptoms, though in a certain number of cases failure of appetite, troubled sleep, or bad humor could be noted, with thirst, pulse-frequency, and slight elevation of temperature. Fever varied with the intensity of the eruption and the gravity of the infection, lasting 24 hours in 178 cases, 2 to 3 days in 481, 4 days in 109, and 5 to 6 days in 15. The highest elevation of temperature was ordinarily observed on the evening of the second day after eruption. Second attacks were observed very rarely; in 14 cases the interval was 8 to 18 months; in 5 other cases there were 2 subsequent attacks of the disease. Among the complications the most frequent was furunculosis; next in order was submaxillary and cervical adenopathy (27 cases) alone, or combined with inguinal adenopathy (5 cases), suppuration of glands being noted twice. Other complications were: Erysipelas (15 cases); osteitis (34 cases), sometimes associated with synovitis (4 cases); and otitis media (17 cases). Nephritis was noted in 5 cases, 3 of which terminated in death from uremia. Albuminuria, sought for in 251 cases, was found in 42.

Marfan and Hallé[2] record 2 rare instances of **suffocative laryngitis** complicating varicella. The first case, an infant of 3 years, showed marked evidences of laryngeal obstruction of so severe a grade that antitoxin was administered under the idea that the case was one of primary laryngeal diphtheria. The first vesicles of varicella now appeared, with aggravation of the dyspnea, calling finally for tracheotomy; the child recovered. Cultures proved the absence of diphtheria-bacilli. In the second case, a weakly infant of 9 months which died on the seventh day from acute diarrhea and bronchopneumonia, antitoxin was also given unnecessarily. The autopsy showed a small round, deep ulcer at the posterior margin of the right vocal cord. In these 2 cases a varicellous exanthem of the laryngeal mucous membrane had determined a stenosis, giving the clinical picture of a true croup. The only case of varicella involving the larynx previously reported is that recorded by Boucheron in his thesis,[3] in which the affection took the aspect of a spasm of the glottis without symptoms of laryngitis. The case terminated fatally by

[1] Ejenedelnik, 1895, No. 28, p. 421. [2] Rev. mens. des Mal. de l'Enf., Jan., 1896.

[3] Etude sur les Complications respiratoires de la Varicelle et Relation d'un Cas de Varicelle du Larynx, Paris, 1893.

suffocation during an access of the spasm. The authors conclude that involvement of the larynx in varicella occurs early, about or shortly after the appearance of the eruption—a point that serves to distinguish it from secondary and unrelated infections. Anatomically, the laryngitis is characterized by small ulcerations, circular, few in number, seated usually upon the true cords. About these ulcers the mucous membrane may be the seat of hyperemia more or less intense and extended. These two lesions explain the two forms under which the complication occurs, as is shown by the authors' cases on the one hand and by Boucheron's on the other.

Pertussis.—Paralysis due to hemorrhage occurring during a paroxysm of whooping cough is not an extremely rare accident, but is almost always manifested as a more or less complete hemiplegia, as is illustrated by 2 cases reported by Theodor,[1] one of which was followed by chorea. Palsy of the sixth and seventh cranial nerves, as observed in a case reported by Craig of Londonderry,[2] therefore demands mention, if only for its rarity. In this case there was left facial palsy, partial only as regards the orbicularis palpebrarum and the frontalis, and complete palsy of the external rectus oculi. The lesion was believed to be a venous hemorrhage involving the nucleus of the sixth nerve, affecting also contiguous fibres of the seventh.

Marfan[3] in an experience of 40 cases of pertussis has found **bromoform** superior to antipyrin or belladonna. His formula is: Bromoform, 48 drops; oil of sweet almonds, 20 g.; gum adragante, 2 g.; gum arabic, 4 g.; cherry-laurel water, 4 g.; and water sufficient to make 120 c.c.—Mix the bromoform and oil and vigorously agitate; then add the other ingredients. A coffee-spoonful contains 2 drops of bromoform. For infants under 6 months the daily dose, given in 3 portions, is 2 to 3 drops; over 6 months, 3 to 4 drops. From 1 year to 5 he gives 4 drops for each year of the age, and from 5 to 10 years the initial daily dose is 20 drops. These doses may be gradually increased till doubled. His experience does not bear out the claim made by Stepp that the duration of the convulsive stage is shortened. Eaton's[4] plan for giving bromoform is to begin with a known safe dose and then rapidly push it to the limit of evident relief of symptoms. He orders it to be administered by simply dropping it in a little water. An important fact to which he calls attention is that a fluidram contains about 360 drops of bromoform, owing to the high specific gravity.

Ullmann[5] strongly advocates the fresh-air treatment of pertussis. For sake of comparison between the period passed out of doors and that passed in the house, he has noted in a series of cases the hours spent in each, and the number of paroxysms and their intervals under the two conditions. From these data he concludes that the fresh-air treatment is one of the most efficacious, if not the only one, for the management of a case of whooping cough. The child should pass the entire day out of doors, not only in the warm season, but

[1] Arch. f. Kinderh., Bd. xx. S. 219.
[2] Brit. Med. Jour., June 13, 1896.
[3] Rev. mens. des Mal. de l'Enf., Apr., 1896.
[4] Jour. Am. Med. Assoc., Oct. 12, 1895.
[5] Jahrb. f. Kinderh., Bd. xl. S. 39.

even at all times of the year, provided it be not stormy. It is considered only necessary to prevent the child from running or talking or otherwise provoking an access of coughing. Contrary to general teaching, he advocates the open-air exposure of the patients even when there is bronchitis or bronchopneumonia, the only precaution being to have the little ones well wrapped up. This plan he has practised with infants a year old suffering from grave bronchopneumonia. During this treatment the author employs neither a specific nor a narcotic. In the presence of very grave bronchopneumonia he prescribes spirits of camphor as an expectorant.

A new drug for the treatment of pertussis is **phenocoll hydrochlorate,** which has been prominently brought to notice by Vargas.[1] This observer reports 42 cases successfully treated. The dose varied from 0.07 g. to 2 g. daily, given usually in mucilage or in water, in which it is soluble in the proportion of 1 to 17. The action of the drug seems to be not as a germicide, but as a sedative to the trigeminus and laryngeus superior nerves. For the first 2 weeks this effect is only a passing one, for on suspending the remedy the paroxysms gradually return. He makes an energetic protest against the open-air treatment, arguing that the child does not obtain the necessary rest, and that lung-complications are very apt to appear, owing to the changes of temperature to which the patient is exposed. A second great danger is the impossibility of isolating the child under this mode of treatment. In all of the 42 cases treated the good results were noticeable within 12 hours, but in some cases the number of paroxysms was reduced only on the following day. Even in very young children and in complicated cases this remedy produced neither nausea, vomiting, collapse, nor other disagreeable consequences. The drug is very quickly excreted, elimination beginning within 20 minutes after taking and being completed in 15 to 20 hours.

Vincenzo[2] reports satisfactory results from **vaccination** in 13 out of 14 cases of pertussis. [Favorable testimony for this method of treatment continues to be received from time to time, much of it indeed from Italy. It is a simple expedient, and if done with antiseptic care should add no gravity to the case. If the child has never been vaccinated, it is stated, the best effects may be hoped for; but the operation should still be tried with children already vaccinated, in the hope that the power of the first inoculation may have become weakened sufficiently to permit of a new "take."]

Kourlow[3] gives an elaborate description of the **ciliated ameba** first observed by Deichler in 1886, and considers it the specific organism causing pertussis. It is best detected, he says, in the early stage, before the mucus has become purulent. It is a unicellular organism, varying in size from half that of a red blood-corpuscle to that of the white corpuscle, or even larger. One side or two opposite sides are bordered with long cilia, which are in constant motion, producing rapid oscillatory movements. It may be readily stained with Ziehl's carbol-fuchsin.

[1] Therap. Woch., Jan. 5, 1896.

[2] La Pediat., June, 1895.

[3] Vratch, No. 3, 1896.

Tuberculosis.—Two cases of acute tuberculosis lighted up by an attack of **typhoid fever** are recorded by Haushalter.[1] The patients were brothers aged 4 and 7 years. The younger, who was first affected, had a severe attack of typhoid, succeeded by apyrexia of several days' duration, and then followed the evolution of acute tuberculosis of the lung simulating a relapse of typhoid. The autopsy showed the lesions of typhoid fever and those of a miliary tuberculosis of the lungs, the origin of which was found in long-standing disease of the bronchial glands. The elder boy, who had had Pott's disease since the age of 3, was taken ill of typhoid 3 weeks after his brother. On the 12th day an abundant intestinal hemorrhage occurred, followed by a tendency to collapse, and death suddenly on the 20th day. Typhoid ulcerations were found in the bowel, and in the right lung an acute tuberculosis. The author refers to the great difficulties in exact diagnosis in such cases, and advises a guarded prognosis of typhoid fever in children disposed to tuberculous disease or in those harboring torpid tuberculous lesions.

In commenting on a case of intestinal tuberculosis in a baby of 16 months due to ingestion of the bacillus from a local tuberculous lesion of the gum, Marfan and Apert[2] refer to the **rarity** of this intestinal lesion **in the first 2 years of life.** They quote Wiederhofer's statistics, which show that it forms only 8% of all tuberculous lesions at this period of life, as opposed to 28% in the period from 2 to 15 years of age. They state that intestinal lesions may be found, first, in an acute miliary tuberculosis, as small gray granulations in the mucosa, of hematogenous origin; second, in cases of the pulmonary disease with cavities, assuming the common ulcerous form seen in adults; and, third, after the ingestion of tuberculous material, usually milk-food, where there may be no lesion of the mucosa, the bacillus having traversed it to find a suitable nidus in the mesenteric glands; or scattered submucous nodules may be found, pea-sized, filled with gray or cheesy, softened material, limited by a delicate fibrous covering, and corresponding in position with the affected mesenteric glands.

Manicatide[3] has found **the spleen** affected in 10 out of 12 cases of tuberculosis of children examined after death; 8 showed distinct macroscopic evidence of the disease, and in the remaining 2 its presence was evident in microscopic preparations. Some of the cases examined had presented a more or less generalized tuberculosis, but in several of those showing lesions in the spleen the disease elsewhere was of quite limited extent. In all the cases examined the spleen was increased in size, even when the evolution had been slow: this observation confirms the views of Landouzy and Henoch, who have always insisted upon the hypertrophy of the spleen in tuberculous children. Histologically, if the evolution of the disease has been rapid, gray granulations predominate, with congestion of the organ; if the progress has been less rapid and the child is of more advanced age, the tubercles are caseous and the connective tissue increased. In only 1 case was amyloid

[1] Rev. méd. de l'Est, June 1, 1895. [2] Rev. mens. des Mal. de l'Enf., June, 1896.
[3] Ibid., Feb., 1896.

degeneration of the small vessels found. Giant cells are numerous, but bacilli scarce. Contrary to the general conclusion reached in the recent thesis of Benzançon,[1] Manicatide has found that tubercles develop not only in the interior of the Malpighian corpuscles, but may be found often in the pulp, in the interstitial tissue, about the veins, and even in the capsule of the organ.

Zappert[2] recognizes 3 groups of pathologic changes which in the course of a **tuberculous meningitis** may produce hemiplegia. These are—1. An exudation upon the convexity of a hemisphere; 2. A focus of softening or inflammation in the capsular region; 3. Exudation upon the cerebral peduncle. He records 7 cases and quotes extensively from the literature.

Gaffié[3] has used **tuberculin** in children for diagnostic purposes with very satisfactory results in 20 cases of pulmonary tuberculosis. The dose employed, $\frac{1}{2}\frac{1}{0}$ mg., gave rise to no complication and occasioned only slight inconvenience, such as dryness of the mouth, headache, constriction of the chest, and redness of the face.

Referring to the difficulties in the **diagnosis of pulmonary tuberculosis** in children, Kossel[4] states that he has frequently made the diagnosis of a pulmonary lesion by a bacteriologic examination of the stools, even in cases of children whose intestines were unaffected and functionating normally. The paper also contains a valuable study of the pathologic anatomy of the disease based upon the autopsies of 23 cases in infants from 2 months to 5 years of age, and in 17 other cases where the disease was not recognized till the autopsy.

Klebs[5] states that **antiphthisin** offers most favorable results, especially in the tuberculous affections of childhood. The selection of cases, however, is of the greatest importance, and the fullest benefit can be expected only when cases are selected which present neither septic complications nor conditions of exhaustion and marasmus. Cases will also be found in which, on account of the great extent of the purely tuberculous disease, failure may result. These limitations, however, suggest that the remedy should be employed in the earlier periods of the disease, and that valuable time should not be lost in the employment of symptomatic treatment only.

Syphilis.—Robinson[6] classifies **the joint-diseases** in children due to syphilis as follows: 1. Epiphysitis of infants; 2. Symmetrical effusions, usually from 8 to 15 years of age, these 2 forms being essentially associated with the congenital disease; 3. Osteitis (*a*) with simple effusion; (*b*) with gummatous infiltration of the synovial membrane and effusion; 4. Primary gummatous synovitis; these forms being met with in either the inherited or acquired disease.

[While **oculomotor palsy** is not a rare manifestation of the tertiary stage of syphilis in the acquired form of the disease, an extensive search of the literature shows that very few instances of isolated palsy of the ocular muscles have been described in connection with the inherited disease.] An

[1] Thèse de Paris, 1895.
[2] Jahrb. f. Kinderh., Bd. xl. S. 170.
[3] Thèse de Paris, 1895.
[4] Zeit. f. Hyg. u. Infektionskrankh., 1895, Bd. xxi. S. 59.
[5] Jour. Am. Med. Assoc., Oct. 12, 1895.
[6] Brit. Med. Jour., May, 1896.

instructive case of the kind has been recorded by Zappert.[1] A girl of 5 years, after a few days of malaise, headache, and vomiting, manifested a paralysis of the muscles supplied by the left oculomotor nerve, with iridoplegia. There were no stigmata of syphilis and no visceral lesions, but the mother had suffered from syphilis before the child's birth. Complete cure followed after 3 months of specific treatment. The author believes the lesion to have been a peripheral neuritis.

Coutts[2] in his Hunterian Lectures reviews the question of the **transmission of syphilis,** drawing attention to the remarkable persistence of the power of syphilitic infection transmitted by father to child. Maternal syphilis he finds is more injurious to the infant than is paternal. He believes that inherited syphilis is occasionally contagious, but that the virulence of such contagion has been grossly overestimated. He suggests as a reason for this infrequency of infection that the disease dates from conception, and not from birth, and at the age at which symptoms appear the disease is generally of about a year's standing, and may have lost some of its pristine virulence during both uterine and extrauterine existence. He also suggests that some product absorbed by the mother in her first pregnancy may influence the succeeding conceptions and largely modify the disease and its power of contagion in the infants resulting from these conceptions. In marked contrast with the rarity of infection from inherited syphilis is its frequency from the acquired form in infants.

Glandular Fever.—Soca[3] records a case of glandular fever in a boy of 11 years in whom on the 13th day acute nephritis developed. Albumin continued to be found in the urine for more than 2 months. In general symptoms the case was almost identical with those described by Pfeiffer and Von Stark, but differed from them in the occurrence of nephritis, which followed the course of a typical scarlatinal inflammation. A second case, which resembled closely that reported by Comby a few months before,[4] presented a slight albuminuria from the beginning, lasting 6 days, or 2 days longer than the febrile period of the disease. [If we can accept the accuracy of this observation, we must conclude with the author that glandular fever is not always a malady of slight importance. Further observations of the kidney-condition in this affection will be awaited with interest.]

Erysipelas.—Successful employment of antistreptococcic serum has been made by Steele in a case of extensive erysipelas in an infant 3 weeks old.[5] No other treatment was adopted, beneficial results being observed soon after the first of the 3 injections made.

GENERAL NONINFECTIOUS DISEASES.

Rachitis.—In the **etiology** of rickets Garrod and Fletcher[6] direct attention to what may be termed the maternal factors in the causation of this

[1] Arch. f. Kinderh., Bd. xix. S. 161.
[2] Lancet, Apr. 11, 18, 25, 1896.
[3] La Méd. infant., Sept. 15, 1895.
[4] Ibid., Jan. 15, 1895.
[5] Brit. Med. Jour., Dec. 7, 1895.
[6] Ibid., Sept. 21, 1895.

disease, and thus emphasize very opportunely the fact that there are other causes at work besides bad hygienic surroundings and improper food. Under the head of antepartum causes they group—1. Ill-health, malnutrition, or disease of the mother during pregnancy; 2. Want of fresh air and exercise during pregnancy; 3. Numerous and rapid pregnancies; 4. Multiple pregnancy; 5. Advanced age of mother at birth of child; 6. Lactation during pregnancy; 7. Heredity; 8. Syphilis. Illustrative cases are quoted. As postpartum causes they enumerate—1. Deficiency of milk-supply due to (*a*) abnormalities of mother—*e. g.* retracted nipples; single available breast, owing to abscess, new growth, etc.; (*b*) abnormalities of child—*e. g.* hare-lip, cleft palate, etc.; (*c*) sharing of supply by twins; (*d*) deficient activity of gland. 2. Deficient quality of milk-supply due to (*a*) mother's ill health during lactation; (*b*) menstruation during lactation; (*c*) pregnancy during lactation. 3. Excessive duration of lactation. Almost all the cases quoted were in children fed upon the breast at the time of development of the disease or until within a short time before—an observation which goes to show that in England, at least, rachitis in breast-fed children is not a rarity.

Of considerable interest in this connection is the experimental study by Rey[1] upon the **absorption and elimination of lime-salts.** This subject was investigated some years ago by Rudel, who concluded that the absorption of lime-salts from the intestine was accomplished in the same way in both rachitic and nonrachitic subjects, and that rachitis should not be attributed to an insufficient absorption of the lime-salts of the food. Rey's researches confirm Rudel's earlier conclusions. A comparative study of the influence of phosphorated cod-liver oil, the plain oil, and phosphorus alone upon the absorption and elimination of lime-salts in rachities showed that the phosphorated oil decidedly increases both absorption and elimination, even more notably than does the plain oil. On the other hand, phosphorus alone seemed to exercise no influence upon either process.

Thompson[2] records a case of **tetany** associated with laryngospasm in a rachitic child aged 15 months, in which the thyroid extract was not only ineffectual, but seemed to aggravate the condition. In the light of the very encouraging results obtained by Bramwell[3] from thyroid extract in a similar case, it is evident that we still lack much important knowledge of the physiologic activity of the thyroid secretion and of the nature and pathology of tetany, which doubtless will be elucidated in the near future. Sterling's[4] study on rickets, which is especially valuable for the extensive bibliographical list accompanying it, deserves mention among the notable papers of the year.

A further contribution to the discussion on the integrity of the **sense of taste** in rachitic children [see *Year-Book* for 1896, p. 560] is made by Neumann.[5] Using quinin as the test, this observer found that in 36 normal children 7 (19%) had no taste-perception, while 14 gave moderate and 15 strong

[1] Deutsch. med. Woch., No. 35, 1895.
[2] Arch. of Ped., Mar., 1896.
[3] Brit. Med. Jour., June 1 and 22, 1895.
[4] Arch. f. Kinderh., Bd. xx. S. 1.
[5] Jahrb. f. Kinderh., Bd. xli. S. 155.

response. Among 93 children with moderate or marked rachitis, 27 (29%) were without taste, 30 gave moderate and 36 strong response. Or, by separating cases with laryngismus or a more general spasmodic condition, 48 children remain, giving in 9 cases (17%) no reaction, in 19 a moderate and in 20 a strong response. Of the 44 rachitics showing spasmodic symptoms, taste-reaction was wanting in 17 (39%). It is thus seen that taste-perception is wanting in rachitic children no more frequently than in the nonrachitic, excepting only among those suffering from convulsive conditions, in whom such defect is more frequent.

Scurvy.—Little that is new has appeared upon this interesting disease since our last review. Cases have been reported from various parts of the United States, notably those of Snow,[1] Love,[2] Merriman,[3] Miller,[4] Machell,[5] Garber,[6] and Cheney.[7] Morse[8] reports 2 cases, 1 of which bears out Starr's[9] contention, as noted last year, that prolonged sterilization is capable of producing scurvy even where the quality and proportions of the ingredients of the milk-mixture are all that could be desired. A case reported by Douglas[10] and 1 by Abt[11] also add corroborative testimony to this view.

[In Germany **the rachitis-theory** still holds a prominent place, though there has appeared some testimony in favor of the English and American view.] Freudenberg[12] reports a case occurring in a child of 9 months, fed upon the breast till the age of 3 months, and then upon sterilized milk. During an attack of pertussis scorbutic symptoms developed. The child was seen by Prof. Baginsky, who diagnosticated "Barlow's disease" and advised phosphorated cod-liver oil. No improvement followed in the next 15 days, and an antiscorbutic treatment was then adopted, consisting of lemon-juice to the gums and the yeast of beer internally. The symptoms of scurvy disappeared in 15 days. In consequence of the rapid cure under antiscorbutic treatment after the failure of medication addressed to a supposed rachitic condition, the author concludes that Barlow's disease is really an infantile scurvy. Four cases, 3 of which were fatal, have been reported by Meyer.[13] All 4 children were between the ages of 5 and 7 months, had been fed exclusively upon Rieth's albumose-milk, and were rachitic. [One of the fatal cases was certainly scorbutic, as the postmortem notes clearly show, but the other 2 cases are very doubtful, despite the author's ingenious argument for their admission as instances of "Barlow's disease."] The apparent deleterious effects of albumose-milk were attributed by Hamburg, who discussed the paper, to the presence of a notable quantity of potassium carbonate used in the manufacture of the preparation. This defect he stated had been already remedied by the substitution of the corresponding sodium salt.

[1] Buffalo Med. Jour., Aug., 1895.
[2] Jour. Am. Med. Assoc., Oct. 12, 1895.
[3] Kansas City Med. Index, 1896, p. 104.
[4] N. Y. Med. Jour., Dec. 21, 1895.
[5] Canad. Pract., Sept., 1895.
[6] Therap. Gaz., Apr. 15, 1896.
[7] Med. News, Feb. 29, 1896.
[8] Boston M. and S. Jour., Apr. 2, 1896.
[9] Am. Jour. Med. Sci., Dec., 1895.
[10] Arch. of Ped., Oct., 1895.
[11] Chicago Med. Recorder, Jan., 1896.
[12] Arch. f. Kinderh., Bd. xix. S. 217.
[13] Ibid., Bd. xx. S. 202.

Townsend[1] reports 12 cases of scurvy, 6 of which were seen in dispensary practice [an unusual experience, since hitherto the disease, according to general observation, has been almost exclusively encountered among the well to do]. As regards the diet, 2 had been fed on proprietary food and water without any milk; 5 on condensed milk and water (generally very much diluted), with some proprietary food added in all but 1 case; 1 on boiled milk and a proprietary food; another on sterilized milk and oatmeal water; while 3 had been fed on a mixture of cream, milk, and water with sugar of milk, sterilized at 212° in 2 cases, and pasteurized at 167° in the third. Of the last 5 cases, there were 2 in which the quality of the food, although not up to the standard, was of fair strength, and where boiling in one and steaming at 212° in the other were employed. In both cases the quality of the milk mixture was improved when the sterilization was omitted, so that a fair estimation of the influence of sterilization could not be gained.

Osteopsathyrosis.—Griffith[2] reports a case of idiopathic osteopsathyrosis, or fragilitas ossium, in a boy who had had several fractures occurring at or soon after birth, and who up to the age of 2 years had suffered in all 17 or 18 fractures from the slightest causes. His general health was good, and there was no constitutional affection in him or his parents to account for the condition. With regard to the pathology and diagnosis, the author discusses the relation of the disease to rickets, osteomalacia, and to imperfect osseous development. While he believes that the disease may and probably does bear a certain relation to these pathologic conditions, he is certain that it is not of a rickety nature, although it may sometimes be combined with this disease.

Diabetes.—An elaborate study of diabetes in childhood has been made by Wegeli,[3] based upon 108 cases collected from the literature and 28 coming under his own observation. Heredity seems to play a prominent part in etiology, and after this traumatism; 2 instances were attributed to anesthesia, 1 by chloroform, the other by nitrous oxid. In the first year of life the disease is naturally very rare, only 3 cases out of the entire number being under 1 year of age. The longest duration of the disease was 4½ years in one of the cases coming under the author's own observation. A rapidly fatal case in a boy of 3 months is recorded by Bell.[4] A paternal aunt had died of the disease. [This case and 2 collected by Wegeli, each aged 3 months—1 reported by Caron, the other by Niehues—probably mark the earliest age at which the disease has been observed.]

A case of **glycosuria** apparently **dependent upon** the presence of numerous **thread-worms** in a child of 5 years is recorded by Parry.[5] After expulsion of the worms by santonin the glycosuria disappeared and the child regained its former health.

Arthritis Deformans.—A rare example of arthritis deformans in a child 6½ years old is described by Koplik.[6] The disease had existed about 18

[1] Boston M. and S. Jour., May 21, 1896.
[2] Med. Rec., May 9, 1896.
[3] Arch. f. Kinderh., Bd. xix. S. 1.
[4] Edinb. Med. Jour., Feb., 1896.
[5] Brit. Med. Jour., June 8, 1895.
[6] Arch. of Ped., Mar., 1896.

months; all the joints of the extremities were affected, and pain in one joint or another was almost constantly present. Almost every known remedy had been tried without avail; the pain, the most distressing symptom, seemed most relieved by salicylic acid. The author thinks there are many points in favor of the neurotic origin of these cases, as was suggested by Charcot, from the symmetric affection of the joints, the atrophy of muscle and skin, and the absence of syphilis or tuberculosis in the child or in its ancestors, and finally the absence of cardiac lesion and rheumatic history. If only those cases that correspond with the Charcot-Weil description and portrait be taken into account, there are only about 18 cases of this interesting disease recorded in the literature.

Infantile Myxedema.—Burckhart [1] reports a case of infantile myxedema in a girl of 3 years who since birth had exhibited increasing symptoms of the disease. Thyroid feeding produced marked improvement, but death occurred within 3 months from bronchopneumonia. The autopsy showed the normal tissue of the thyroid replaced by a mass of fat. Another case, first seen at the age of 6½ years by Parker,[2] has been reported, with photographs, after a year's thyroid treatment. At the time of the report she had the appearance of any healthy child from 2 to 3 years of age, but was unable to talk—with the exception of saying a very few simple words like "dad," "mam," etc.—and had several healthy permanent incisors, most of the old black stumpy milk-teeth having disappeared. In this case 5 gr. in tabloid form were given every week-day for 6 months, and the dose was then increased gradually to 10 in a week, 1 daily and an extra half on alternate days; finally, 2 every day were given. [For so young a child the dose tolerated is unusually large.] Two cases illustrating satisfactory results of treatment are recorded by Emily Lewi from Koplik's clinic,[3] and Koplik [4] gives the notes of another case which showed improvement during the short time it was under his observation.

Those interested in the subject will find a table of 40 published cases of **cretinism treated by thyroid administration** appended to a paper by Peterson and Bailey,[5] who also record 2 cases showing satisfactory results.

New Growths.—Fisk [6] reports a case of multiple large round-celled sarcoma in a child aged 6 months. The largest growth, which was situated in the interscapular region, had a circumference at the base of 17 in.; there were also masses in the right axilla, and one in the left popliteal space. Coley's erysipelas-toxin was tried, and the largest tumor began to break down rapidly, but death from septicemia occurred on the 10th day of treatment.

DISEASES OF THE DIGESTIVE ORGANS.

Congenital Teeth.—Ballantyne [7] gives the notes of 3 cases of congenital teeth. One of these, observed by Vargas of Barcelona, was an instance of an

[1] Rev. méd. de la Suisse Romande, June 20, 1895.
[2] Brit. Med. Jour., Feb. 8, 1896.
[3] N. Y. Acad. of Med., Section on Pediatrics, Mar. 12, 1896.
[4] Arch. of Ped., Feb., 1896.
[5] Pediatrics, May 1, 1896.
[6] Arch. of Ped., Apr., 1896.
[7] Edinb. Med. Jour., May, 1896.

extraalveolar dental sac containing an unruptured fangless tooth. It occupied a position corresponding to the left central incisor of the lower jaw. A bibliography contains the references to 66 cases recorded.

Effects of Nutrition upon the Teeth.—The influence of nutritional disturbances in infancy upon the development of the teeth is well shown in the results of Barton's[1] examinations of the teeth of 202 children. Of this number there were found 10 cases of well-marked erosion of permanent teeth, and 5 cases of erosion of the milk-teeth. The latter cases occurred in 67 hand-fed children. Of the entire number of children, 24 had been fully breast-fed, and there was no case of erosion among them; 2 cases of very early decay were associated with very bad artificial feeding. In 1 case in which there had been temporary bad feeding with a patent food in early infancy the permanent teeth showed a horizontal line marking the period at which nutrition had suffered.

Diseases of the Liver.—A case of congenital atresia of the hepatic duct, with cirrhosis of the liver, under the care of Finlayson, is reported by M'Callum.[2] Jaundice was first observed at the age of 2 weeks. Death occurred in the fourth month. As has been observed in cases of actual obliteration of the ducts, the stools, though pale, were, as a rule, yellow, and sometimes green. Even in the last days of life the stools were of a bright-yellow color. The common bile-duct and the cystic duct were pervious from the duodenum to the empty gall-bladder, but the duct from the liver was represented by a mere cord.

Edwards[3] completes the report of the case of **hepatic cirrhosis** which formed the basis of his paper on the subject published in the Archives of Pediatrics, July, 1890. Several beautiful characteristic microphotographs of the liver tissue, made by Gray, illustrate the marked increase in both interlobular and intralobular connective tissue. The author thinks that the Germans have presented evidence which makes it probable that softening in the neighborhood of the lenticular nuclei (most markedly shown in a case of cirrhosis in a boy aged 10 years, reported by Ormerod),[4] has some essential connection with the disease.

Gilbert and Fournier[5] report 7 cases of **hypertrophic cirrhosis** of the liver occurring in children or adolescents, dating back to ages varying from 5½ years in the youngest to 17 years in the oldest of the cases described. In general characteristics the clinical phenomena in the child do not differ essentially from those belonging to the adult type—hypertrophy of liver and spleen, jaundice with its train of secondary symptoms, absence of ascites, and maintenance, for a long time, of the appetite and general health. Some special points of distinction, however, deserve mention. In 3 of the cases the hypertrophy of the spleen greatly exceeded that of the liver, so that while the latter extended only 1 or 2 fingers' breadths below the false ribs, the spleen

[1] Brit. Med. Jour., Sept. 21, 1895.
[2] Arch. of Ped., Nov., 1895.
[3] Ibid., July, 1895.
[4] St. Bart's Hosp. Rep., vol. xxvi., 1890.
[5] Rev. mens. des Mal. de l'Enf., July, 1895.

filled the entire left flank, reaching the umbilical line and descending well into the pelvis. Such a disproportion between liver and spleen does not occur in adult cases. Another peculiarity in 3 of these cases was found in certain nutritive changes in the bones of the phalanges of fingers and toes and in the extremities of other bones—changes which have not been previously described in connection with this disease. These lesions resembled those described by Marie under the name of ostéo-arthropathie hypertrophiante pneumique, but in the most marked case the hypertrophy of liver and spleen was too slight to interfere with respiration—an important element in the etiology of Marie's disease. A third point to which attention is directed is the retardation in development exhibited by such patients, especially when the disease begins about the time of puberty.

Auché and Coyne[1] report a case of **acute yellow atrophy of the liver** in a girl of 10. At the autopsy the colon bacillus was found in the biliary vessels, though 8 hours before death an examination of the blood of the median cephalic vein gave negative cultures. The case confirms Hanot's assertion relative to the existence of a grave hypothermic icterus determined by the bacterium coli.

Diseases of the Gastrointestinal Tract.—Under the general heading of **Summer Diarrhea** the whole subject of the gastrointestinal diseases of hot weather may be considered. Numerous valuable papers have appeared during the year, most of which show the influence of the recent contributions to our knowledge of the pathology and bacteriology of these diseases. Among these may be mentioned the papers of Allyn,[2] Northbridge,[3] and Engelmann.[4] In the question of treatment the general teaching seems to be coming down to well-established principles and greater uniformity in therapeusis. Notable differences of opinion, however, still occur. A very sensible paper by Snow[5] describes the symptomatology and treatment of these cases at the Buffalo Fresh-air Mission Hospital. According to his experience, the only medicines producing positive effects are opium and subnitrate of bismuth. Intestinal antiseptics—calomel and sodium salicylate excepted—were rejected after trial. Intestinal irrigations are largely used, preferably warm. If the feces contain much mucus, borax is added to the water, and if astringents are indicated, 1 to 2% solutions of tannic acid are used. In toxemic states saturated boric-acid solution is employed in large quantities (2 to 4 quarts), being used once or twice daily. Calomel is advocated if the stomach be irritable. Fever is controlled by hydrotherapy, and stimulation by whisky is employed in nearly all cases where vomiting is not produced. Strychnin, strophanthus, and caffein are also of value, hypodermic stimulation being of great value in case of sudden cardiac depression. This epitome is fairly representative of the consensus of professional opinion. Fischer[6] strongly advocates betanaphthol bismuth in doses of 5 to 10 gr. to a child of 1 year every 2, 3, or 4 hours.

[1] Congrès de Méd. interne, Bordeaux, Aug., 1895.
[2] Univ. Med. Mag., July, 1895.
[3] N. Y. Med. Jour., Sept. 14, 1895.
[4] Jour. Am. Med. Assoc., Oct. 12, 1895.
[5] Buffalo Med. Jour., Jan., 1896.
[6] Med. Rec. July 13, 1895.

Alcohol he rarely uses, and then preferably by rectal injection in a large quantity of water. As astringents, Poole[1] uses only nitrate of silver or tannic acid in irrigating solutions; as a purgative and antifermentative, calomel.

As to the particular purgative to be employed in the early stages, there is considerable difference of opinion. In the discussion on several papers read before the Section on Diseases of Children of the American Medical Association Booker[2] stated that he relies on **calomel** in fractional doses, while Koplik[3] said he feared mercury in any form, but favored **magnesium sulphate.** This drug was strongly advocated by Patterson,[4] who reports 2 series of 25 and 55 cases treated exclusively with it. In the second series 2 died and 7 did not report after the first day. From 1 teaspoonful to a tablespoonful of the salt, according to the age, moistened sufficiently to be swallowed, was given daily until the discharges became yellow. The children were reported to be relieved of pain and restlessness, with the induction of quiet sleep. The after-treatment consisted of general tonics. Griffith[5] believes in the judicious use of **opium** after food has been stopped and the intestinal canal thoroughly cleansed. Weaver[6] also approved of the use of calomel, and thought opiates necessary. The use of **intestinal antiseptics** in infantile diarrhea is admirably discussed by Fenwick,[7] who has discarded astringents and opium. In almost every instance in his experience where these latter remedies had been previously tried without effect the substitution of an antiseptic was at once followed by complete success. "Acute dyspepsia is readily cured by dietetic treatment combined with the use of castor oil or an emetic. Antiseptics are only necessary when the disorder has already continued for several days and has resisted the simpler methods. Under these conditions calomel is of the utmost value when administered in doses of $\frac{1}{6}$ to $\frac{1}{3}$ gr. every 3 or 4 hours." In chronic diarrhea due to fermentation he believes in the use of antiseptics that exert their specific action within the stomach, where the disorder commences. In such cases he now uses **resorcin** in doses of 3 gr. every 4 hours, even for infants only a few weeks old. When the disorder has lasted for a long time and follicular ulceration of the large intestine exists, the drug may be advantageously supplemented by those remedies which exert their antiseptic properties in the intestine, and of these **benzol-naphtol and salicylate of bismuth** are to be preferred. The former is but slightly toxic, and must be given in full doses at short intervals (as high as 40 gr. in 24 hours have been given with excellent results).

Frederick Holme Wiggin[8] presents some interesting statistics of **infantile intussusception** and its treatment drawn from the study of 103 cases collected from the literature. Nearly 50% occurred during the 4th, 5th, and 6th months, in nearly equal proportions; 75.4% of the cases occurred in males, and 89% were of the ileocecal variety. Abdominal tumor was seldom absent, as was to be expected in such a large proportion of cases of the ileo-

[1] Cincin. Lancet-Clinic, Aug. 3, 1895. [2] Jour. Am. Med. Assoc., Oct. 12, 1895.
[3] Ibid. [4] Ibid. [5] Ibid. [6] Ibid. [7] Brit. Med. Jour., Dec. 1, 1895.
[8] Med. Rec., Jan. 18, 1896.

cecal variety. Several of the reporters called attention to the necessity, in all suspected cases of this trouble, of making a conjoined abdominal and rectal examination, for in some instances a tumor was revealed by this means after abdominal or rectal palpation alone had failed to discover it. Thirty-nine of the cases were treated only by means of inflation or enemata, or both. Of these, 16, or 41%, recovered. The average hour after the onset when the treatment began was the 41st. Of cases in which celiotomy was performed, 64 were collected, 21 of which, or 32.8%, were successful, the average age of the infants being 6½ months. In 17 of these cases inflation or enemata, or both, had previously been tried without success. If from the total number of cases those are eliminated in which either the operation was abandoned, the bowel incised, and an artificial anus made, or resected and an anastomosis effected, there are left 45 cases, of which only 24 resulted fatally, reducing the mortality to 53.4%. If, again, only those operations are counted that have been performed since the perfected technic of abdominal surgery has become generally known—say since 1889—there results a total of 18 cases, of which 14 were successful and 4 unsuccessful, or a mortality of only 22.2%, which the author believes is a fair estimate of the risks of abdominal section to-day performed on a young infant for the relief of this disorder, if done within the first 48 hours after onset.

Ruhrah[1] has seen postmortem intussusceptions occur during an autopsy upon the body of a year-old infant 20 hours after death from endocarditis. When the belly was opened the intestines appeared normal, but 5 minutes later, while the thorax was being dissected, a portion of the ileum, 6 cm. in length, was observed to invaginate itself into the gut below. Handling of the intestines provoked a repetition of the phenomenon in no less than 20 or 30 instances. [It is stated that no solutions were used in or about the abdomen. It would be interesting to know what medication had been employed.]

In the early treatment of **perityphlitis** in childhood Schlossmann[2] holds that the intestines should be kept as quiet as possible, in the hope of arresting the inflammatory process and of aiding the formation of firm localizing adhesions. In childhood, as Matterstock and Parker have pointed out, necrosis and gangrene of the appendix occur more frequently and with greater rapidity than in adults: for this reason the author advises that purgatives and enemata should be prohibited. He quotes a case recorded by Schäfer[3] in which perforation of the appendix and secondary rupture of the abscess into the abdominal cavity were justly attributed to purgatives and enemata given prior to admission to the hospital. Opium, he thinks, is indicated. It should be given in doses approaching the toxic limit, under careful observation. In such conditions the drug is well tolerated, and, according to the author's research, there is no record of a case of perityphlitis in which alarming symptoms have been produced by opium. In view of the rapid course run by perityphlitis in childhood the author is inclined to early operation.

[1] Arch. of Ped., Apr. 1, 1896. [2] Münch. med. Woch., Oct. 8, 1895.
[3] Deutsch. med. Woch., No. 14, 1895.

Pseudomembranous enteritis is so unusual in early life that Snow's case,[1] in a girl of $2\frac{1}{2}$ years, deserves mention. After a severe attack of whooping cough she developed ileocolitis, which lasted 6 weeks. In the most acute stage of the diarrhea she began to pass pieces of membrane and tubular casts of the bowel; 6 weeks later, the membranes being daily in the feces, several round-worms were evacuated, after which no more membrane appeared in the stools for $4\frac{1}{2}$ months, when, coincident with an attack of grippe-bronchitis, bits of membrane and 2 ascarides were passed for 2 days. Contrary to the usual experience in adult cases, the passage of the casts was not accompanied by pain or tenesmus, and caused no more discomfort than the passage of a normal stool. The association with lumbricoids was regarded as accidental.

Intestinal Parasites.—Mitra[2] has seen a case of fatal exhausting diarrhea in a child 10 years of age, apparently dependent upon the presence of a large number of round-worms in the intestine. During the 8 days the child was under treatment 111 worms were passed.

Congenital Hypertrophy of the Colon.—Three new cases of congenital hypertrophy of the colon are recorded by Berti.[3] In all the descending colon deviated to the right and terminated in a sigmoid flexure which ascended along the vertebral column, and then descended, this unusual course being permitted by a long and very movable mesocolon. These cases, with those reported by Mya in 1894 [see *Year-Book* for 1896], bring the total of cases hitherto reported up to 12.

THE BLOOD AND CIRCULATORY SYSTEM.

Cardiac Anomalies.—Several cases of cardiac anomaly have been recorded, notably those of Acker[4] and of Holt;[5] similar cases were briefly referred to in discussion by Packard and McDonald.[6] In Holt's case, in a female child 9 months old cyanotic from birth, the aorta was $\frac{5}{8}$ in. in diameter, and arose from both ventricles, the origin being directly over the ventricular septum, but more from the right than from the left ventricle. The pulmonary artery was about one-fourth the size of the aorta. The pulmonary opening admitted only a very fine probe; this was so small that probably no blood passed through it during life. The ductus arteriosus was open, the diameter being about $\frac{1}{12}$ in. The right ventricle was much larger than the left and its walls were twice as thick. The ventricular septum was deficient at its upper portion, the opening being $\frac{1}{2}$ in. in diameter. The right auricle was much enlarged, the left auricle small. The pulmonary veins were very small. The foramen ovale was closed and the auricular septum normal. The systemic circulation was carried on chiefly by the right ventricle, as only a very small amount of blood could reach the lungs through the pulmonary artery by way of the ductus arteriosus. The chief supply to the lungs was probably through the bronchial arteries.

[1] Jour. Am. Med. Assoc., Oct. 12, 1895.
[2] Boston M. and S. Jour., Dec. 5, 1895.
[3] La Pediatria, May and June, 1895.
[4] Arch. of Ped., Nov., 1895.
[5] Ibid.
[6] Ibid.

In another case, seen by Railton,[1] in a child of 4 years, dead of bronchopneumonia, the tricuspid valve was the seat of large verrucose vegetations covered with a deposit of fibrin. Close to the tricuspid orifice were a few other vegetations on the auricular edge, and one recent irregular ulcer. The remaining orifices and valves were normal, and the ductus arteriosus and foramen ovale were closed. There was a deficiency of the septum of the ventricles about the undefended space large enough to admit a quill. This opening was larger at the side of the left ventricle than on the right side, where it ended between the insertion of two cusps of the tricuspid valve nearer to the right auricle than to the ventricle. The edges of this orifice were quite smooth. It was evident that the lesion of the tricuspid valve had started during fetal life, and it seemed almost equally clear that the endocarditis had also continued its evolution subsequently to birth. Railton is inclined to believe the defect in the septum to be the cause of the endocarditis.

The Cardiac Hypertrophy of Growth.—The present status of the so-called "cardiac hypertrophy of growth," which was first described by Blache in his thesis (Paris, 1869), and later most valiantly championed by Germain Sée, is very satisfactorily sketched by Romme.[2] He quotes the recent critical studies of Huchard,[3] Potain and Vaquez,[4] and Springer,[5] all of which arrived at the conclusion that the cardiac hypertrophy of growth does not exist, and that when a hypertrophy is observed during adolescence the cause must be sought in some more definite and pathological condition. To this opinion the author most heartily subscribes.

DISEASES OF THE RESPIRATORY SYSTEM.

Nasal Catarrh.—Bermann[6] urges the necessity of paying attention to the slight nasal catarrhs occurring in young infants, since these repeated congestions cause permanent derangement of the mucous membrane and deflexion of the nasal septum. For this purpose he applies carefully to the nasal passages a camel's-hair brush wet with a 2% solution of silver nitrate, and instructs the nurse or mother to make such an application whenever the child is noticed to make any noise in breathing through its nose. For chronic nasal catarrh associated with mucous hypertrophies or polypoid degeneration he strongly recommends the use of trichloracetic acid. The nose is first cocainized, and the pure acid is then applied by means of a glass tube drawn out to a fine point and bent at a proper angle, being blown out of the tube on to the hypertrophied area. The tube will hold only a small fraction of a drop by capillary attraction, so that no danger of an excess of acid need be feared. The galvanocautery, he states, produces cicatricial tissue and gives rise to a dry catarrh, while the use of trichloracetic acid is followed by no sloughing, and a normal mucous membrane results. These applications should

[1] Lancet, Aug. 10, 1895.
[2] Rev. mens. des Mal. de l'Enf., Apr., 1896.
[3] Congrès français de Méd. de Lyon, 1894, p. 788.
[4] Sem. méd., 1895, p. 413.
[5] Ibid., 1895, p. 490.
[6] Arch. of Ped., Oct., 1895.

be repeated at intervals of from 1 to 2 weeks. Even in cases of atrophic catarrh or ozena the use of this acid is said to have been followed, after sufficiently long treatment, by complete cure.

Retropharyngeal Abscess.—Hand[1] reports a case of mumps in a boy of 22 months, the subsidence of the parotid inflammation being followed by enlargement of the lymphatic glands at the angles of the jaw, by an extremely irregular fever, and by intense anemia. No cause could be assigned for the persistent temperature elevation, which followed the hectic type, until about 2 weeks after the onset of the parotitis, when the presumptive diagnosis rested between tuberculosis and retropharyngeal abscess. Physical signs of either disease, however, were wanting, but attacks of cyanosis and trouble in swallowing now began to be noticed. The pharynx, except for slight catarrh, exhibited no abnormality, and continued so for 11 days longer, when after an interval of 48 hours between visits, a fluctuating swelling was observed nearly occluding the pharynx. Incision of the abscess was followed by rapid subsidence of symptoms, convalescence being interrupted only for a day by incipient mastoiditis. [The case is noteworthy for the slow development of the abscess, since the process in children is rarely prolonged beyond a week.]

Koplik[2] contributes a valuable paper on the acute retropharyngeal abscess of infancy and childhood, based upon an experience of 77 cases. He holds that in the light of our present knowledge the term "acute idiopathic" as applied to this affection is erroneous. The anatomic investigations of Gillette have shown that the retropharyngeal space is the seat of several lymph-nodes which are intimately connected with the system of lymph-vessels of the tonsils, the soft tissues of the palate which are connected with the deep facial glands, and the deep cervical. All infectious processes invading the tonsils or soft palate or lesions of the mucosa of the mouth are liable to draw into sympathy these retropharyngeal glands. One or more of these nodes may be affected, and in the latter case the retropharyngeal swelling may be felt and seen from the inside of the mouth, and also recognized by a palpable swelling on the side of the neck. The author has succeeded in isolating 4 distinct species of streptococci, which were the only organisms present in the pus of the acute nontuberculous abscess; these he divides into 2 classes—the streptococcus brevis pharyngis (*a* and *b*) and the streptococcus longus pharyngis (*a* and *b*). Animal experiments with both varieties of streptococci failed to produce effects similar to those seen in experiments with streptococci taken from virulent pus. In no animal was tuberculosis produced from the injection of any of the pus in its pure crude state, thus showing that the contention of some observers, that the acute retropharyngeal abscess in many cases is tuberculous, is unfounded. A study of the age in this series shows that the affection is preeminently one of infancy, 65 of the 77 being under 1½ years, and 55 under 1 year of age. The author advances a forcible argument for operation by internal incision, reserving the external operation, as advised by Burkhardt, for the chronic tuberculous form, for the burrowing septic variety, and for those cases where the deep cervical

[1] Arch. of Ped., July, 1895.

[2] N. Y. Med. Jour., Apr. 4, 1896.

glands are involved. Dollinger[1] also records a case in a child of 8 months, the subject of general tuberculosis. [The fact that so large a number of cases have been observed within the short period of 6 years shows that the possibility of the presence of this affection must be constantly borne in mind.]

In this connection attention should be directed to an important monograph upon this subject by Damm.[2] It is based upon the extensive hospital service of the author, and is supplemented by histories of cases furnished by Edmund Owen of London and Henry Ashby of Manchester. A complete bibliography dating back to 1820 is appended.

Nondiphtheric Membranous Angina.—Comby[3] calls attention to the not infrequent occurrence of pseudomembranous inflammations of the mucous membrane of the tonsils, nose, pharynx, or even larynx, of infants and young children—appearances which are too readily accepted by the physician as diphtheric, and for which the most rigorous specific treatment is at once adopted, with all the anxieties and hardships to the family incident to a declared case of diphtheria. The author points out that in many of these cases bacteriologic cultures show the presence of streptococci or staphylococci and the absence of the Klebs-Löffler bacillus. The statistics which have lately been gathered in connection with the serum-treatment of diphtheria have shown that in many hospitals as high as 25% of the cases applying for treatment are proved by culture-tests to be spurious cases. [While the course of these cases, when primary, is sometimes attended with severe constitutional symptoms, the outcome is very usually favorable, provided the patient be spared the heroic local and constitutional treatment so frequently instituted for diphtheria.]

Enlarged Bronchial Glands.—West[4] reports 2 cases of enlargement of bronchial glands occurring in brother and sister, in which creasote effected a relief from all symptoms. Whether this fact is to be taken as an indication of a tuberculous condition is left an open question by the author.

Pneumonia.—Claude[5] records a fatal case of croupous pneumonia in a delicate child of 2 years in which the autopsy revealed phlebitis of the cerebral veins, with thrombosis of the dural sinuses, extensive extravasation of blood, and softening of the brain-substance. Cultures from the extravasations and softened substance produced colonies of the staphylococcus albus, but those made from the thrombi showed characteristic colonies of the diplococcus pneumoniæ. Although the pneumococcus has been established as a frequent cause of meningitis, the author believes this to be the first recorded instance of cerebral phlebitis caused by this organism. In other cases the bacterium coli commune or streptococci have been found.

An interesting glance at the **treatment of pneumonia** at six of the largest children's hospitals in the United States is afforded by a series of short

[1] Jahrb. f. Kinderh., Bd. xli. S. 146.

[2] Bidrag til Laeren om den Akute, Saakaldte Idiopatiske Retro-pharyngeal Absces hos Born. Kjobenhavn, Ernst Bojesen, Olsen & Co., 1896.

[3] La Méd. infant., Aug. 15, 1895.

[4] Arch. of Ped., May, 1896.

[5] Rev. mens. des Mal. de l'Enf., July, 1895.

papers[1] contributed by members of their medical staffs. These institutions are the St. Mary's Free Hospital for Children, New York, the Babies' Hospital, New York, the Children's Hospitals of Philadelphia, Boston, and Washington, and the New York Foundling Hospital, the reporters being, respectively, Swift, Holt, Griffith, Buckingham, Adams, and Northrup. After careful comparison, the practice in all these institutions is found to be much the same. Swift and Holt, more than the others, insist upon the maintenance of a temperature of 70° to 75° F. in the ward, and advocate steam inhalations, with vaporization of creasote, pine-needle oil, turpentine, or benzoin. In view of recent writings against the use of alcohol in acute disease in children, it will be noted with interest that this drug is largely employed in all these representative institutions. The poultice is passing out of use, except occasionally for pain or dyspnea; the cotton jacket has been altogether discarded by some of the writers; and expectorants as a routine are less and less used. Counter-irritation, however, especially in the lobular form of the disease, is universally employed. Preference seems to be given to hydrotherapic measures to control excessive temperature, and antipyretic drugs are but exceptionally given. Apart from alcohol, other drugs used as stimulants are strychnin, digitalis, and carbonate of ammonium, named in the order of frequency. The value of nitroglycerin as a powerful cardiac stimulant is especially mentioned by most of these observers.

Empyema.—Koplik[2] shows that in the empyemas of childhood there are bacteriologically 4 main groups of cases: Those in which are found—1. The diplococcus pneumoniæ, fully 53.6% (Netter) to 60% (Koplik) of the entire number; 2. The staphylococcus pyogenes; 3. A streptococcus which may be of a benign or virulent variety; and 4. The tubercle-bacillus; but the literature from time to time records cases in which the Eberth bacillus and the bacillus coli communis are the causative agents, yet so infrequently as not yet to have permitted a formulation of our knowledge of these cases. If to the pure metapneumonic cases is added a distinct percentage of doubtful pleurisies, which in Netter's table are credited to the streptococcus or staphylococcus or to a mixture of these two, the empyemas in children which are nontubercular reach a proportion of fully 75%. This is in marked distinction to the conditions found in adults, according to the statistics of Netter, and more recently of Eichhorst,[3] which place the frequency of tuberculous pleurisies among adults at from 68.5 to 65.2%. Other aspects of empyema in children, as regards diagnosis and treatment, are well discussed in papers by Caillé and Winters.[4]

Edmund Cautley[5] of London publishes deductions in regard to the treatment of this interesting condition founded upon the records of 86 cases under 12 years of age, most of which were treated in St. Bartholomew's Hospital from 1883 to 1893. Of these cases no less than 84 were instances of uni-

[1] Arch. of Ped., Apr., 1896.
[2] Arch. of Ped., Feb., 1896.
[3] Correspondenz-blatt f. schweiz. Aerzte, 1895.
[4] Arch. of Ped., Feb., 1896.
[5] Internat. Med. Mag., May, 1895.

lateral effusion. It is in cases left entirely to nature that the characteristic sequelæ and deformities are most commonly found. The same results occasionally follow in cases treated on approved methods, but of long continuance before reaching the surgeon's hands. Small purulent effusions, he believes, are sometimes absorbed, but such a result is very uncertain, and the risk incurred by a policy of nonintervention far outweighs the risk of surgical interference. Absorption after aspiration is more probable when pneumococci only are present then when streptococci are found. If one aspiration does not result in cure, he is strongly opposed to repeating the operation. The assertion that the chances of perfect cure are better under treatment by resection, he thinks, is not supported by clinical experience, since in the series it is found that of the patients thus treated more were discharged with a sinus than was the case in those treated by incision. The interval of time during which the sinus is kept open depends upon the length of time the tube is kept in position. Early contraction of the side is more likely to follow resection than incision. The indications for resection, he states, are as follows: 1. When the ribs are so close together that it is impossible to drain the cavity without it—a condition that rarely occurs in children and only likely to be found in long-standing cases; 2. When subsequently to the simpler operation drainage is found to be imperfect, the indications consisting in a high temperature and an offensive discharge; 3. When the lung has reexpanded and the chest-walls contracted, and yet the sinus does not close; resection of portions of several ribs is generally required in such cases. In cases of double empyema the best treatment, according to the author's conclusions, is simple incision and drainage, allowing an interval of a few days to elapse between the two operations. More particularly in cases of double general effusion he thinks it better to aspirate first on both sides in order to diminish the quantity of fluid and relieve the heart. Next day operation should be made on one side, and a few days to a week later upon the other side. The left side should be chosen for the first operation, and local rather than general anesthesia employed. In cases of general effusion on one side and localized effusion on the other evacuation of the general effusion should be first done, and the operation repeated on the other side a few days later. Finally, in cases of double localized effusion simultaneous drainage may be adopted, but it is a wise precaution to wait a few days between the two operations.

DISEASES OF THE NERVOUS SYSTEM.

Hydrocephalus.—As a means of diagnosis between intraventricular and extraventricular effusions, d'Astros[1] suggests the propriety of exploratory puncture. In ventricular hydrocephalus the small proportion of albumin and the abundance of sodium chloride found in the exudate furnish a ready means of distinguishing the cerebrospinal fluid from that found in the extraventricular effusion. While surgical intervention in internal hydrocephalus offers little hope of amelioration, he believes that the encysted condition of an

[1] La Méd. infant., Nov. 15, 1895.

external effusion and its comparative isolation from the nerve-centers justify further efforts to relieve such conditions by surgical means.

A remarkable case of fetal hydrocephalus, an illustration of which is presented (Fig. 128), has been recorded by Alexander Fulton[1] of Philadelphia. The mother was a healthy tertipara, 28 years old, 5 feet $2\frac{1}{2}$ in. in height, weighing 90 lb. The fetal head contained about 2 quarts and a pint of serum, weighing 8 lb., and measured 23 in. in the fronto-occipital circumference.



FIG. 128.—A case of fetal hydrocephalus (Univ. Med. Mag., Dec., 1895).

Meningitis.—For purposes of diagnosis Quincke's operation of puncturing the vertebral canal has given some encouraging results. Fürbringer[2] reported to the Medical Society of Berlin that he had practised this puncture more than 100 times upon 86 patients. The 2d, 3d, or 4th intervertebral space in the lumbar spine was chosen, the patient sitting up rather than reclining, general anesthesia not being necessary. With new-born infants the needle should penetrate about 1 cm., and with older children the depth should be increased, approaching 7 cm., which is the depth necessary in the robust adult. The amount of fluid withdrawn may reach 110 c.c.; 37 of the cases examined had tuberculous meningitis; in 30 of these the liquid withdrawn contained the tubercle-bacillus, thus verifying the diagnosis in 80% of the cases, among which several presented insufficient clinical symptoms to warrant a definite diagnosis. In 3 cases of serous meningitis the therapeutic results were transient. In another case creamy pus was withdrawn, permitting the establishment of a diagnosis of cerebrospinal meningitis, as was subsequently verified by autopsy. In another case with symptoms of myelitis and pneumonia the pneumococcus was found in the greenish-colored liquid withdrawn. A. Fränkel[3] agreed with Fürbringer that the operation was harmless if properly done. The puncture should be made about on the plane of the junction of the superior and middle third of a spinous process,

[1] Univ. Med. Mag., Dec., 1895.

[2] Rev. mens. des Mal. de l'Enf., June, 1895.

[3] Ibid.

about 2 fingers' breadth from the median line. After passing through the skin the needle should be directed a little upward and inward. Heubner[1] prefers the lumbar puncture to tapping of the ventricles in chronic hydrocephalus. Rotch and Wentworth,[2] however, saw very alarming symptoms after puncture in a child 2 years old with marked cerebral symptoms attending double seropurulent otitis media. Only 6 c.c. of a clear fluid were withdrawn, but immediately after the operation the child became restless, the pulse rose to 250 a minute, respiration was superficial, and the skin cool and slightly livid. The child subsequently recovered, and no information was obtained from analysis of the spinal fluid.

Lazard,[3] who made the puncture in a case of tuberculous meningitis in a child of 13 months, succeeded thereby in checking the convulsions and bringing about a peaceful termination 24 hours later. Caillé[4] has had an experience of 4 cases. In the first 2, in children 3 and 5 years old suffering from tuberculous meningitis, bacilli were found sparingly in the flaky sediment of the cerebrospinal fluid. Wolfstein[5] also records a case in which by puncture he demonstrated the presence of staphylococci, streptococci, and pneumococci, and the absence of tubercle-bacilli. An extensive purulent meningitis without tubercle was found at the autopsy. He agrees with other observers as to the value of the method in diagnosis.

Syphilis of Nerve-centers.—Bézy[6] records the case of an infant 2 months old with a brachial diplegia of several days' duration. The father had contracted syphilis after his marriage. There was no evidence of the pseudoparalysis of Parrot. Cure resulted under antisyphilitic treatment. The lesion, according to the author, was not in the anterior portion of the vertebral column, because of the absolute integrity of the lower limbs, but affected the nerve-centers. The case should be classed, he thinks, with those recorded by Blocq[7] and by Vicarelli.[8]

Chorea.—After a study of 35 cases of chorea, the subsequent histories of which could be followed, Meyer[9] concludes that all cases of chorea minor in children are of rheumatic origin, and that where other causes seem to be active they merely play a predisposing or exciting role. In fully 80% of his observations the rheumatic character of the chorea was shown (*a*) by its sometimes appearing as an equivalent for a polyarthritic attack or after an articular explosion taking the place of a relapse; (*b*) by the contemporaneous appearance of other rheumatic manifestations in endocardium or joints; (*c*) by the fact that, in the predisposed, chorea can bring about the sequelæ of rheumatic lesions; (*d*) by the fact that in times of epidemic prevalence of articular rheumatism chorea also is much more commonly observed; and (*e*), finally,

[1] Rev. mens. des Mal. de l' Enf., June, 1895.

[2] Boston M. and S. Jour., Dec. 12, 1895.

[3] Jour. de Clin. et de Thérap. infant., May 7, 1896.

[4] N. Y. Med. Jour., vol. xli. No. 24, 1895.

[5] Arch. of Ped., Mar., 1896.

[6] Congrès de Gynéc., Obstét., et Pédiat., Bordeaux, Aug., 1895, in Rev. mens. des Mal. de l'Enf., Sept., 1895.

[7] Rev. de Neurol., Nov. 30, 1894.

[8] Arch. ital. di Pediat., Sept., 1891.

[9] Jahrb. f. Kinderh., Bd. xl. S. 1.

that chorea yields to antirheumatic treatment. In the remaining 20% of cases, while no direct evidence of rheumatism could be adduced, yet no contradictory evidence was to be found, and in symptoms and course no distinction from the positively rheumatic cases could be observed.

After a review of the very meagre literature bearing upon the so-called **"congenital chorea,"** Johnston[1] concludes that the existence of a true congenital chorea is extremely doubtful, or has, at all events, not yet been established. All of the few cases reported which could be seriously considered seemed, in the author's opinion, to be examples of double athetosis due either to developmental defect or to meningeal hemorrhage injuring and irritating the motor cortex. The same subject is considered in Vignaud Dupuy's recent thesis.[2] While many of the recorded cases are rejected as doubtful or spurious, 6 cases from the literature, with 1 of his own, enable the author to draw the usually accepted conclusions in regard to this condition.

Anterior Poliomyelitis.—Trevelyan[3] gives a histologic study of a case of infantile paralysis dying from independent causes 11 months after the onset of the disease. The case thus occupies a middle position between cases of very recent origin and the old cases, in which the changes are so advanced as almost to preclude an opinion as to the starting-point of the disease. The changes here noted seemed to be entirely in favor of the disease being primary in the neuroglia including the arteries. On the other hand, there was no definite localization of the disease to any one or more groups of ganglion-cells. The overgrowth in the neuroglia, including the spider cells, was very striking, this being probably due to the irritation of the poisonous products (toxins) escaping from the blood, the infective theory apparently offering the best explanation of the etiology of the disease. Changes have been found in the neuroglia in quite recent cases, so that the irritation theory would appear best to account for the changes in the neuroglia, certainly in the earliest cases. It is interesting to observe that in this case, as in others previously examined, microorganisms have not been found in the cord. Yet the possibility of occurrence of epidemics of infantile paralysis as recorded by Medin,[4] and the experimental evidence as given by Roger,[5] and more recently by Thoinet and Masselin,[6] strongly support the view that the disease is infectious. It is most probable that it is the poisons excreted by the microorganisms that set up the disease, and this accounts for the early vascular phenomena found in the cord.

Spinal Sclerosis.—Moncorvo[7] reports 3 cases of sclerosis *en plaques* in children who bore the marks of hereditary syphilis, to prove the truth of his contention that the latter disease is capable of giving rise to the cord-lesion. This view was advocated in a paper in the same journal,[8] but seems to have met with little acceptation. Pierre Marie in his Leçons sur les Maladies de la Moelle states that there is not a single infectious disease which may not cause

[1] Am. Jour. Med. Sci., Oct., 1895.
[2] La Chorée congénitale, Paris, 1895.
[3] Brain, 1895, parts lxx. and lxxi.
[4] Centralbl. f. klin. Med., 1891.
[5] Rev. de Méd., 1893.
[6] Ibid., June, 1894.
[7] Rev. mens. des Mal. de l'Enf., Sept., 1895.
[8] June, 1887.

sclerosis *en plaques*, but he adds that syphilis plays no role in the etiology of such cases. Moncorvo remarks, with justice, it seems, that syphilis at the present day deserves to be ranked as an infectious disease, and calls attention to the fact that Marie in the same work attributes to syphilis a predominant role in the etiology of tabes, which, according to Baginsky, approaches histologically more nearly to sclerosis *en plaques* than to a secondary sclerosis.

Multiple Neuritis.—Hammond[1] gives the histories of 10 cases of multiple neuritis occurring among children in the city of Bridgeport, Conn., within a period between Dec., 1894, and Oct., 1895. The ages of the children varied from 4½ months to 4½ years. In 3 cases both arms and both legs were paralyzed; in 2 cases both legs and the right arm were affected; in 4 cases only the legs were implicated; and in 1 case the intercostal muscles were the primary seat of paralysis; 2 of the cases presented typical symptoms of meningitis—1, aged 20 months, recovering; the other, an infant of 4½ months, dying after a lapse of 1 month, but, unfortunately, it was not subjected to postmortem examination. The succession of cases within a limited geographic area and their great similarity point to a common cause of origin, but no light was gained from an examination of the blood. Such a series of cases as are here reported is almost unique. The second case, in a little daughter of a physician, occurred in a house about 100 yards from that in which the first case developed; 6 other cases occurred in the practice of one physician of the city, and another in the practice of the father of the child designated above as the second case. [While by no means conclusive, the coincidences suggest the possibility of the communication of the contagion through the series of cases. This point, however, is not raised in Hammond's paper, but is a natural conclusion from a study of the cases which he here records.]

Raynaud's Disease.—That Raynaud's disease is not unusual at an early age is proved by the researches of Mangue,[2] who has gleaned from the literature, between the years 1880 and 1885, 171 cases in which the age was given. Of these 6 were under 2 years of age and 5 in the 5th year. To these the author adds 3 cases in infants in their first year and 3 in the second. This proportion of cases by the year is not equalled in the series at any age, except in the period from 30 to 43 years.

Krisowski[3] records a case of superficial gangrene of symmetric areas of the external ears in a boy of 3 years with a history of hereditary syphilis. Complete recovery took place under the administration of antisyphilitic treatment. The author discusses the relation of such conditions to cases of Raynaud's disease, properly so called, and concludes that all cases of spontaneous gangrene should be classed as Raynaud's disease, which he regards rather as a symptom-complex than a disease sui generis. [It must be remembered, however, that Raynaud in his original thesis (Paris, 1862) and in subsequent writings was careful to exclude from consideration all cases of local death dependent upon embolism, thrombosis, or changes of an inflammatory character

[1] Med. Rec., Nov. 9, 1895.

[2] Thèse de Paris, 1895.

[3] Jahrb. f. Kinderh., Bd. xl. S. 57.

in the intima of the blood-vessels, though some of the cases collected in Raynaud's original thesis do not properly come within this definition. There are on record, however, a sufficient number of cases—many, indeed, among children—wherein the clinical picture described by Raynaud is clearly reproduced; and until future pathologic studies prove that all such cases now ascribed to vaso-motor spasm are really dependent upon changes in the intima of the blood-vessels, we should reserve for this interesting nosologic division those cases which present the characteristics of Raynaud's description, and should exclude a case clearly dependent upon a syphilitic endarteritis, such as Krisowski's undoubtedly was.]

Hysteria.—Wood[1] records the case of a girl of 10, who, during convalescence from typhoid fever when 7 years old, began to vomit after taking food, and had continued so to do at intervals. Food would be retained for about 8 minutes; the face assumed a pained expression during its retention, and then everything swallowed was vomited in one gulp. Passage of the esophageal bougie produced temporary cessation of the vomiting, and under moral treatment and regimen, with removal from her family, considerable improvement occurred and the vomiting ceased, but she still had difficulty in eating in the presence of strangers. A peculiar symptom of later development was a cough which came on at night after going to bed. A large amount of frothy mucus would collect in the pharynx, causing noisy breathing, relieved only temporarily by a loud cough. This would be kept up for hours nearly every night.

DISEASES OF THE GENITO-URINARY SYSTEM.

Retention of Urine.—As a rare cause of retention of urine in infants Knöpfelmacher[2] instances a case in a female of 9 months, where the cause was found to be a sarcoma springing from the periosteum of the sacral vertebræ and compressing the rectum and neck of the bladder. The possibility of tumor of the adjacent sexual organs, especially in female children, should always be borne in mind in the event of a persistent retention.

Enuresis.—Williams[3] concludes that nocturnal incontinence is to be regarded as a symptom, varying in degree from a simple indication of the naughtiness of a wilful child to the precursory warning of subsequent nervous deficiency, and the treatment of the condition requires careful study into the causation of each particular case. No case should be lightly dismissed as of trivial importance until such careful investigation has been made. When tonic treatment is indicated, he regards potassium iodid as an extremely valuable remedy. Personally, he has seen no benefit from raising the foot of the bed. In the treatment of nocturnal enuresis Macalister[4] uses atropin, in increasing doses up to the limit of tolerance, associated with strychnin. The formula employed for children of 14 years is the following: Neutral solution of atropin sulphat, 2%, 5.60 g.; solution of strychnin chlorhydrate, 1%, 0.25 g.; syrup of bitter-almond peel, 25 g.—M. Sig. 5 to 60 drops in a little water at bedtime,

[1] Austral. Med. Jour., Oct. 20, 1895.
[2] Jahrb. f. Kinderh., Bd. xli. S. 129.
[3] Boston M. and S. Jour., Mar. 12, 1896.
[4] Rev. mens. des Mal. de l'Enf., Feb., 1896.

commencing with 5 drops and increasing 5 drops every 4 days till the dose of 30 drops is reached. If at the end of a week incontinence does not cease, the dose is increased 5 drops every 4 days until 60 drops is reached; then the number of drops is decreased 10 every 4 days till the treatment is finished.

Phimosis.—That many puzzling reflex symptoms may be due to phimosis is a well-known fact. That this condition may be associated with, and apparently be the cause of, severe cerebral symptoms is illustrated by a case recorded by King:[1] A delicate male child of 6 months, offspring of a delicate mother and a father who died of tuberculosis before its birth, was taken ill, after several days of irritability, with fever, frequent liquid stools, hot head, nape of neck sensitive to pressure, opisthotonos, head rolling, mouth hanging open and tongue protruding, cephalic cry, bulging fontanel, retracted abdomen, scanty, infrequent urine, and other symptoms which warranted three physicians who saw the case in making a diagnosis of meningitis. Phimosis with pinhole orifice was found, and after 24 hours, when all the symptoms had become aggravated, circumcision was performed. Within a few hours the fever vanished, the urine became abundant, and all the other alarming symptoms disappeared. [It seems likely that the renal insufficiency in this case played a large part in the causation of the alarming symptoms.]

Vulvovaginitis.—Marx[2] calls attention to the dangers of gonorrheal vulvovaginitis in children. As in the adult female, serious complications may arise, such as urethritis, cystitis, and even involvement of ureters and kidneys, while through the uterus tubes, ovaries, and even peritoneum, may be involved in the infection. In some cases by rectal exploration the author has been able to detect an effusion in the lateral culdesacs, and in several cases he believes he has detected suppurative salpingitis with ovaritis. Pus in the tubes has been found at autopsy in 5 cases of girls 7 to 9 years of age. There is always danger that disease of the adnexa, if not immediately noticeable, may appear later on in life, and menstruation is apt to be established with difficulty. In the great majority of cases of vulvovaginitis Veillon and Hallé[3] have found the gonococcus, though its presence, of course, is not necessarily an evidence of venereal origin. In the very acute cases the gonococcus is most often in pure culture, while in other cases it is associated with the normal bacteria of the vagina. Contrary to the experience of Vahle,[4] who found streptococci in the vaginas of 14% of healthy new-born girls after the third day, these observers assert the absence of pathogenic bacteria in healthy children.

Agramonte[5] reports rapid and satisfactory results in the treatment of vulvovaginitis in children, whether gonorrheal or simply purulent, by vaginal flushing with a solution of permanganate of zinc or potassium (preferably of zinc) of the strength of 1:3000. The fluid is delivered by means of a piece of soft drainage tubing from a gravity reservoir under a head of only 12 to 18 in. Cystitis is treated by irrigations of a 1:6000 solution of the same drug. In 30

[1] S. Calif. Pract., Oct., 1895.
[2] Rev. de Thérap. méd.-chir., May 1, 1895.
[3] Arch. de Méd. expér. et d'Anat. pathol., May, 1896.
[4] Zeit. f. Geburtsh. u. Gynäk., xxxii. No. 3.
[5] Med. Rec., Jan. 11, 1896.

cases, excluding 2 with bladder complication, the average time required to effect a cure was only $12\frac{1}{5}$ days from the time of onset.

Acute Nephritis from Shock.—Holz[1] notes the appearance of blood, albumin, and casts in the urine of a number of adolescents suffering from the shock following a fall from a height. The urine cleared up after 2 to 4 days. In several cases autopsy showed the lesions of acute parenchymatous nephritis. As none of the cases suffered from head-injury, the influence of a cerebral reflex could not be invoked, and the author therefore assumes a direct reaction of the force upon the kidney structure.

Nephritis in the New-born.—A very suggestive paper by Jacobi[2] on nephritis in the new-born is summed up in the following brief conclusions: Nephritis is a frequent disease of infancy and childhood, and by no means very rare in the new-born. What was formerly considered mere albuminuria, or a transient form of it, we have been taught by improved methods of investigation, mainly by the use of the centrifuge, to recognize as nephritis. A predisposition to nephritis in the young is caused by the fragility of the blood-vessels in the new-born; by the relative imperviousness of the young renal capillaries compared with the large size of the renal arteries; by the feebleness of the young intestinal muscle, which proves insufficient to expel toxic contents; by the extensiveness and size of the young intestinal blood-vessels and lymphatics and the large size of the villi, all of which favor the absorption of toxins. From an etiologic point of view nephritis in the new-born may be —1. *Congestive* (from feeble circulation, congenital heart-disease, asphyxia, or exposure to low temperatures). 2. *Obstructive* (from the physiologic rapid decomposition of the blood of the newly-born; the formation of hematoidin = bilirubin; jaundice; the production of methemoglobin by chemic poisons, such as potassic chlorate, or by excessive heat; or the presence of blood in the uriniferous tubes). 3. *Irritative* (from the presence of uric-acid or hematoidin infarctions, of purpuric or other interstitial hemorrhages, or of microbes and toxins in the numerous eruptive and infectious maladies and in enteritis).

Lithiasis.—In a study of 1621 cases of lithiasis among children in Hungary, Bokai[3] draws attention to the influence of circumcision in preventing the condition. Among 636 boys suffering from stone in the bladder or other part of the urinary tract, only 19 were Israelites—*i. e.* circumcised—a proportion (3%) even inferior to that of girls (4%) in the total number of the cases collected. [This observation is also in accord with that of Hunt in his paper on lithiasis (Cyclopædia of the Diseases of Children, Keating).]

Tuberculosis of the Kidney.—Primary tuberculosis of the kidney in children forms the subject of an excellent monograph by Samuel M. Hamill (from the Pepper Laboratory of Clinical Medicine, Philada., 1896), founded upon a case personally observed, and 54 other cases in children under the fourteenth year collected from the literature. His deductions as to the probable starting-point of urogenital tuberculosis in children are fully in

[1] Münch. med. Woch., No. 34, 1895. [2] N. Y. Med. Jour., Jan. 18, 1896.
[3] Jahrb. f. Kinderh., Bd. xl. S. 32.

accord with those of observers who hold to the descending form. In the entire series there are scarcely any cases that suggest an ascending extension, and these few can be as justly classified under descending extension.

Neoplasm of the Kidney.—Fruitnight[1] has recorded a marked case of sarcoma of the kidney in an infant (Fig. 129), especially interesting for the

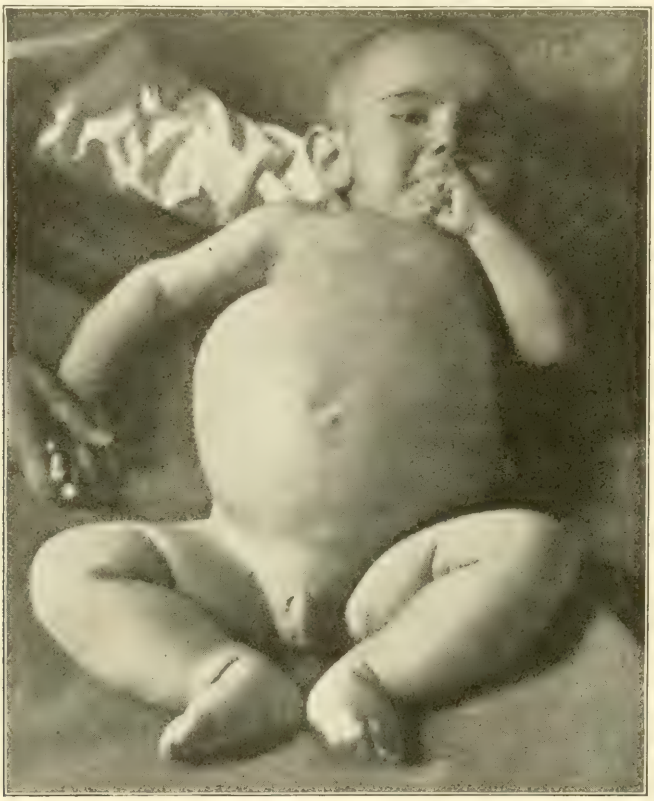


FIG. 129.—Sarcoma of the kidney in an infant of 13 months (Arch. of Ped., Dec., 1895).

fact that treatment with the erysipelas-toxin was tried after operative measures were decided against. The child, a boy of 13 months, presented at the first consultation a large protuberance in the right lumbar region and hypochondrium, which had been noticed for only 3 weeks previously. Erysipelas-toxin containing the bacillus prodigiosus was obtained from Dr. Dillon Brown, and daily injections in the gluteal region were made, the dose beginning at 3 and increasing to 17 minims by the 9th injection. When the supply was exhausted an interval of 4 days elapsed before a new supply was procured, and the injections were recommenced, beginning with 2 minims; 15 injections in all were given. A slight acceleration of pulse and elevation of temperature followed each injection, but the temperature never rose above 102° F. Death occurred on the day of the 15th injection. Absolutely no effect was produced

[1] Arch. of Ped., Dec., 1895.

upon size or course of growth or upon the general condition of the patient. In reviewing the cases recorded by Dr. Coley, in which successful results were obtained, Fruitnight calls attention to the fact that in all the cases the sarcomata were located externally, as on the chest, back, clavicle, abdominal wall, palate, hand, sternum, breast, etc., all the locations being accessible to treatment applied in the immediate radius of the disease; none of the cases reported were of internal visceral origin or attachment. The tumor in the present case weighed $4\frac{1}{2}$ pounds. The microscopic examination is interesting from showing the presence of striped muscular fibers and adenomatous tissue in parts. Four cases in young children, 2 of them aged 13 and 16 months, the other 2 about 4 years, have recently been reported by Steele.[1] Two of the cases were operated upon with successful results. One, an infant, aged at the time 16 months, remained well 18 months after the operation; the tumor was classified as a melanoliposarcoma. The second case, a small spindle-celled growth, was in a girl aged 3 years and 8 months. She recovered from the operation, and was well at the time of the report, 4 months afterward. Emily Lewi[2] also contributes a paper on sarcoma of the kidney in children, and tabulates from the literature 60 cases in which nephrectomy was done.

Neoplasm of the Bladder.—Primary neoplasm of the bladder in childhood is sufficiently rare to call attention to a case of multiple small-celled sarcoma observed by Löhr in a female $3\frac{3}{4}$ years old.[3] The case was submitted to operation by Nitze, but was reported before the subsequent result was known. The author states that only about 30 cases of primary tumor in this viscus in children have been recorded, most of them malignant, and only 1 out of 15 operated upon, a myxosarcoma observed by Gussenbauer, has not been followed by rapid return and death. [It is quite probable that these figures could be considerably enlarged by a study of the literature of other countries.] A somewhat similar case, of American origin, is recorded by Sims[4] in a girl of 3 years. Vesical symptoms had been present for 18 months preceding the examination. The growth, which was subsequently proved to be a myxofibroma, had grown rapidly in the last 3 months, causing obstruction to the flow of urine, with prolapse of the rectum and of a portion of the tumor through the urethra. During preparatory treatment the prolapsed mass slipped back into the bladder, and a portion of it sloughed off and was passed. The growth was found to spring from the anterior wall of the bladder just above the urethra—an unusual situation. As large a portion of the tumor as possible was removed by scissors through the urethra, and the patient was doing well 6 weeks after the operation.

Neoplasm of the Vagina.—D'Arcy Power[5] records a case of primary sarcoma of the vagina in a child of 2 years and 4 months, with a brief epitome of 24 other cases gleaned in rather a hasty examination of the literature. From a consideration of these cases he states that primary sarcoma of the

[1] Ann. of Gynæc. and Ped., Jan., 1896.
[2] Arch. of Ped., Feb., 1896.
[3] Berl. klin. Woch., Apr., 13, 1896.
[4] Med. Rec., Apr. 18, 1896.
[5] St. Bart.'s Hosp. Rep., 1896, vol. xxxi.

vagina is only a specialized form of malignant disease, which may affect any or all of those connective tissues which are involved in the complicated developmental processes associated with the formation of the cloaca. It grows in the connective tissue of the pelvic organs, and extends into the bladder, the urethra, the uterus, or the vagina, being either circumscribed or diffuse; in either form this growth shows an almost constant tendency to be polypoid and multiple—a characteristic which has given the Germans the term *traubensarcom* as applied to this variety of growth affecting the female generative organs. In children primary sarcoma does not run a very rapid course, and does not ulcerate readily nor usually affect the lymph-glands. Prognosis is grave, recurrence taking place quickly after removal. While polypi are often looked upon as innocent growths, such formations about the rectum and generative organs in children are extremely rare unassociated with malignant disease. Complete cure in 1 or 2 cases of primary sarcoma of the vagina in children shows that early and complete removal may be effectual in some instances.

THERAPEUTICS.

Antipyrin.—Comby[1] states that he uses antipyrin with confidence in pediatric therapeusis in spasmodic states like chorea and pertussis, in painful conditions, and in the febrile states attending typhoid fever, pneumonia, and the eruptive fevers. He has frequently given at a dose as much as 50 cgm. per year of age, prolonging its administration for several weeks without observing any accident imputable to the drug. [The doses here given are considered distinctly dangerous by physicians of wide experience in this country. That such doses have been given by Comby without accident is to be regarded as an interesting experience, which doubtless depends upon the rapidity of elimination in childhood.]

Alcohol.—Emmerich[2] agrees with Grosz[3] that there are only two indications for the administration of alcohol to children: 1. In sudden heart-weakness in the infectious diseases and in collapse in the acute gastric catarrh of infants or following great loss of blood; 2. In chronic disturbances of nutrition, such as are found in rachitis, scrofula, and tuberculosis, in which alcohol through its decomposition acts as a food and retards tissue-waste.

Asaprol.—In a series of 58 cases Moncorvo[4] has found that asaprol is well tolerated, producing in healthy infants no appreciable influence upon temperature, pulse, or respiration. In only 2 cases did it give rise to an erythema; this disappeared in 2 days after withdrawal of the drug. In many cases it increases the quantity of urine, notably in malarial fever, but not if albuminuria exists. A property not previously ascribed to the drug is that of checking hemorrhages, 7 instances of which are cited. The dose employed has varied from 4 to 45 gr. in 24 hours, given in sweetened water to which is added syrup of tolu, gooseberry, or canella. In malarial fever it acts by lowering temperature and modifying more or less rapidly the type of the fever, lessen-

[1] La Méd. infant., Sept. 15, 1895.
[2] Arch. f. Kinderh., Bd. xx. S. 226.
[3] Zeit. f. Krankenpfl., 1895, H. 8.
[4] Bull. gén. de Thérap., Mar. 15–Apr. 30, 1895.

ing the malaise, nervousness, and insomnia and the hepatic or splenic congestion. It sometimes gives rise to a profuse perspiration, but less than that produced by the coal-tar derivatives; in acute tuberculosis, however, its antipyretic action is uncertain. In cutaneous affections, diseases of the ear, nose, mouth, and throat, in vulvovaginitis, and in intestinal disorders it acts excellently as an antiseptic, hemostatic, and cicatrizant. In pertussis, applied upon gauze compresses over the perilaryngeal region (1% solution), it is said to produce rapid curative results.

Tannigen.—Drews[1] speaks favorably of the action of tannigen in the intestinal affections of infants and children. By reason of its tasteless and odorless qualities the drug is readily taken mixed in a teaspoonful of coffee, water, or milk. The average dose is 3 to 5 gr., repeated 3 or 4 times daily.

Trional.—The favorable experience of Claus with this drug [see *Year-Book* for 1896, p. 585] in childhood has been confirmed by Moncorvo.[2] He has found it of value in the wakefulness so common in the early stage of the eruptive fevers, especially measles, variola, and scarlatina, and particularly in the nervous disturbances attending malaria. In 2 cases of tuberculous meningitis the cerebral improvement brought about by trional was marked. In the psychic disorders of cerebral sclerosis and the insomnia which often accompanies subacute or chronic tuberculosis satisfactory effects were obtained. His experience that in painful conditions the drug is not valuable also coincides with Claus's conclusions. The dose varied from 20 cgm. to 1 g. in 24 hours.

TOXICOLOGY.

Alcohol.—Devine[3] records a fatal case of acute alcoholic poisoning in a girl aged 4 years. About 2 ounces of whisky were supposed to have been taken. Shortly after its ingestion she became stuporous, and remained in that condition till death, 22 hours later, with marked signs of pulmonary edema. Medical aid was not summoned till 5½ hours after the drug was taken. The case is interesting for the comparatively small amount of alcohol taken and the rapid progress to a fatal termination with pulmonary edema. The author is led to consider the importance of carefully watching the dose and effects of alcohol administered to children, particularly in chest-cases, since an overdose might produce a fatal pulmonary edema.

Glycerin.—Antichievich[4] records 2 cases in which small quantities of glycerin, used as a vehicle for iodoform-injections, caused toxic symptoms. In the first case, a boy of 8 years, 4 hours after the injection of 15 c.cm. of a 10% iodoform-glycerin emulsion into a cold-abscess cavity, symptoms of acute nephritis appeared, and yielded only after 3 weeks of active treatment. In the second case, a boy of 11 years, 20 c.cm. of the emulsion were first used, and produced fever with symptoms lasting 3 days; a second injection of 18 c.cm. was followed by hemoglobinuria, succeeded by a polyuria lasting 8 days. A

[1] Allg. med. Central-Zeit., No. 35, 1895.
[2] Bull. de l'Acad. de Méd., Sept. 3, 1895.
[3] Boston M. and S. Jour., Nov. 28, 1895.
[4] Arch. f. Kinderh., Bd. xx. S. 91.

third injection of 15 c.cm. of an emulsion in which olive oil replaced the glycerin was followed by no untoward symptoms.

Opium.—Mattison[1] cites a marked case of chronic opium-poisoning in childhood. A baby of 7 months when first seen presented the shrivelled and wrinkled appearance of an old man, and attracted attention by its peculiar solemn manner. The child had been perfect at birth, and had thrived up to the age of 4 months, when, in order to quiet it when fretful, it was given paregoric. It very soon became necessary to give laudanum and to increase the dose, so that when the child was first seen by the physician it weighed only 7 pounds and was shockingly emaciated and extremely weak. It was taking at this time no less than 1 oz. of laudanum daily. The laudanum was reduced 1 drop at each dose, and at the end of 1 month the child had become plump and well again. In the author's experience children had shown a very strong tendency to become victims of morphinism. Abrupt withdrawal of the drug is not to be thought of, but gradual reduction of the dose, together with general tonic measures, constitutes the whole treatment. Tucker[2] stated that he had seen 1 case of congenital morphinism in the offspring of a mother who for several years previously had been addicted to taking morphin and also to smoking opium. At birth the child appeared to be perfectly healthy, but when handed over to a wet-nurse it began to lose ground rapidly. This he attributed to the sudden removal of the baby from the influence of the morphin to which it had been subjected in utero.

[1] Trans. of Section on Pediatrics, N. Y. Acad. of Med., Oct. 10, 1895, from Pediatrics, Jan. 1, 1896, p. 31. [2] Ibid.

NERVOUS AND MENTAL DISEASES.

By ARCHIBALD CHURCH, M. D., and HUGH T. PATRICK, M. D.,
of Chicago.

Outline of the Work and Progress of the Year.—During the past year the current literature, especially on this side of the water, has contained more and more regarding hysteria and its recognition, following largely in the line of the French school. The polymorphism of the disease makes its recognition sometimes extremely difficult, but much has been done to familiarize the profession with the stigmata of the disease. In the matter of diagnosis an article by Patrick is of especial value. Its mimicry of pseudomeningitis is also elucidated in an abstract contained in the following pages. The fact that it sometimes appears in children is generally overlooked, but marked cases are being constantly reported from all over the world that have much in common and serve to establish a type.

In regard to epilepsy the Flechsig treatment is still under advisement. It seems in some old cases to give more relief, at least temporarily, than any other plan of treatment. The optimism that introduced the trephine for focal epilepsy has been gradually disappearing, and the present limitations of this heroic intervention are now being clearly seen. The recognition of the intoxication factor in epilepsy is also now becoming prominent.

Dana recommends the heroic exhibition of strychnin in the treatment of neuralgias, especially of the trifacial; and if others meet with the same success, his contribution to the therapeutics of the disease will mark a distinct step in its management.

Reflex neuroses are being drawn within an ever-narrowing circle which perhaps will eventually see their extinction. The whole subject is admirably summed up by Knapp in an article which is abstracted later on.

The subject of muscular wasting is receiving contributions from all over the world, showing that there is merely a gradation between the so-called progressive muscular atrophy and the idiopathic muscular atrophies or muscular dystrophies. The autonomy of the motor neuron and its trophic functions will probably eventually bring all of these progressive muscular atrophies again into the same classification.

The thyroid treatment of myxedema and cretinism is being established on the firm footing of clinical results, and cases favorably affected by the exhibition of thyroid or by thyroiodin are being constantly recorded. One fact in regard to the relation of the thyroid gland to the economy is now firmly fixed—that lack of its functional activity results in myxedema.

The ever-widening recognition of the relation of the arterial supply to the brain and spinal cord to the etiology and distribution of organic lesions in the central apparatus embraces a number of contributions of importance.

In exophthalmic goiter the tendency is to recognize the condition as due to hyperthyroidation, though this does not well explain all the phenomena of the disease. The question still remains, Why does the thyroid over-act? There are a number of cases showing that the removal of a portion of the thyroid, or otherwise limiting its activity in Graves' disease, exercises a beneficial and often a curative effect.

In tetanus the value of the antitoxins seems less than was at first hoped.

The role played by anemia in the production of changes in the central nervous apparatus is greater than was at first supposed, and cases are being accumulated from far and near showing the prevalence of these changes, especially in the spinal cord, in all forms of pernicious anemia.

The value of Quincke's lumbar puncture is now established as a diagnostic means, and sometimes as a means of treatment, in all cases associated with increased production of cerebrospinal fluid, notably in meningitis.

Cases of syringomyelia are being so rapidly added to the literature that it is evident this disease, which at first was considered a rarity, is one of the not uncommon spinal lesions. It probably has heretofore been considered a curiosity or mistaken for some of the other organic diseases of the cord.

Landry's paralysis seems to be entering the realms of infectious maladies, and especially of infectious inflammatory processes in the cord.

The year has been somewhat barren in pyschiatrical circles.

The polyneuritic pyschoses of recent years are now being recognized as cerebral manifestations of the general intoxication that leads to the neuritis.

The study of heredity continues to widen the field of etiology in all forms of mental disease.

General paralysis seems to be more and more a parasyphilitic condition, and the tendency is growing to consider syphilis as the only cause of paretic dementia.

Thyroid-feeding in insanity has not met with much success. It acts as a mild stimulant in some of the depressed forms of mental disturbance.

NERVOUS DISEASES.

The Diagnosis of Hysteria.—Patrick[1] in a paper on the diagnosis of hysteria calls attention to an important distinctive trait of hysteric anesthesia and hyperesthesia. This is a rapid shifting of the border. If the anesthetic or hyperesthetic area be accurately determined (and it nearly always can be), and the border lightly marked, and the examiner's attention then be directed to the examination of other parts for a few minutes, it will be found on returning to the zone of disturbed sensation that the border has moved $\frac{1}{2}$ to 2 in. (see Fig. 130). This rule applies to most cases of functional trouble (neuralgia excluded) in which there are tender spots along the spine or else-

[1] N. Y. Med. Jour., Feb. 15 and 22, 1895.

where. If the points of maximum tenderness be accurately located and marked with a soft pencil, they will be found 5 or 10 minutes later to have shifted in position. Such a mobility can occur only in functional disease or simulation.

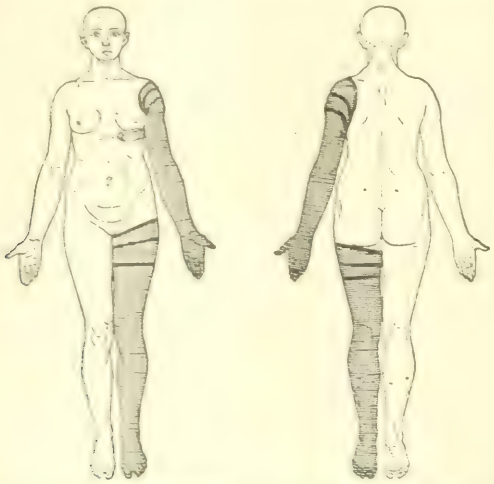


FIG. 130.—Hysterical hemiplegia with most exquisite hyperesthesia. Although the hyperesthesia was so intense and the limits were sharply marked, the shifting of these limits could be demonstrated during the examination, as indicated by the heavy lines (N. Y. Med. Jour., Feb. 15, 1896).

Hysteric Pseudomeningitis.—This peculiar hysteric symptom-complex cannot be exceedingly rare, although scarcely mentioned in English and American literature. Seven cases were reported in 3 consecutive meetings of the Société medicale des Hôpitaux.[1] The first case, reported by Huchard, was that of a woman aged 24, who developed an irregular fever, to which was presently added strabismus, amaurosis, and vomiting; a diagnosis of tubercular meningitis was made. But from some trivial cause she one day had a typical hysteric convulsion, which first disclosed the nature of the case. Comby mentioned 4 cases which he had observed in children, and which are fully reported in the thesis of Roesch. Two of these patients were 14 years, one was 4½ years, and one 9 months [*sic*] of age, and in each instance the original diagnosis was tubercular meningitis. Comby says it is impossible to exclude toxemia as the cause of some of these cases, instead of hysteria, and he prefers the term "meningism," as the cases are similar to those of "peritonism" described by Gubler. Gaillard reported 2 cases. The first, a young woman, had as symptoms intense headache, pain in the epigastrium, persistent emesis, constipation, hyperesthesia, "raie méningitique," and nuchal rigidity, but there was no fever, and she rapidly recovered under proper treatment. The other case was still more striking. A man of 26 presented mental hebetude, general prostration, gun-hammer posture, "raie méningitique," epigastric pain, vomiting, fetid breath, anorexia, hyperesthesia, retention of urine, nocturnal delirium, constipation, and emaciation. There was neither fever nor rigidity back of the neck. After remaining in *statu quo* for some time, the patient, without

[1] France méd., Dec. 20 and 27, 1895, and Jan. 3, 1896.

apparent cause, seemed to suddenly awake as from a dream, began to talk, take nourishment, etc., and a rapid recovery followed. Patrick[1] has reported a case complicated with hysteric blindness. A young woman, aged 30, was attacked with severe pain in the head, which rapidly became more generalized and was accompanied with signs of some systemic affection. Within 48 hours she became totally blind. When seen on the third day the pulse was 120, temperature 100° F.; there were excruciating headache, tenderness and rigidity in the nuchal region, vomiting, constipation, a foul tongue, mental hebetude, general hyperesthesia, and increased reflexes. She also seemed to be deaf in the left ear. At the next examination the diagnosis of hysteria was made, and the symptoms rapidly disappeared under treatment by suggestion. [We have since seen an additional typical case.]

Hysteric Eye-symptoms.—In connection with the foregoing case we might mention one reported by Claude.[2] A neuropathic woman of 29 after an apoplectiform attack presented right hemiparesis, with anesthesia and ocular symptoms on both sides. The hemiplegia was promptly dispelled by hypnotism, the anesthesia persisted, and the ocular symptoms yielded gradually. For the right eye there was amblyopia, dyschromatopsia, monocular diplopia, and loss of pupillary reflex to light. The first three of these symptoms rapidly disappeared, but the last was more obstinate. The left eye presented a more marked amblyopia, which gradually improved, but the pupil remained dilated and unresponsive to light and accommodation. In hypnotic sleep, however, the author was able to dispel both the pupillary dilatation and the lack of reflex, and after that they remained normal. [See case of Booth under *Voluntary Dilatation of the Pupil.*] Kebbell[3] reports 2 cases of hysteric aphonia successfully treated by the application of a spray of ethyl chlorid to the nape of the neck. He thinks it more convenient than electricity and equally efficacious.

Hysteric Contractures.—Weir Mitchell[4] [in a paper containing little absolutely new, but replete with interesting and instructive observations] considers some of the more unusual and severe manifestations of hysteria. The principal point that he makes is that there are two kinds of hysteric contracture—the one local, in which no organic changes occur in muscles or joint, and a generalized form, early affecting several or all extremities, in which the muscles and connective tissue take on a hard, leathery consistence and the reflexes and faradic excitability disappear. In this connection Mitchell misquotes Charcot, saying that he taught that in hysteric contracture there was never sufficient organic change to abolish faradic excitability and to prevent free passive motion under deep chloroform-narcosis, whereas the French savant taught that the exact reverse sometimes was observed. We would particularly call attention to the author's statement that in his wide experience he has never seen a prolonged hysterical contracture suddenly disappear, although he gives credit to the statements of others who have observed this phenomenon. And of almost equal interest at this time is his confession that treatment by metalotherapy, magnets,

[1] Jour. Am. Med. Assoc., Feb. 8, 1896.
[2] Soc. méd. des Hôp., Nov. 29, 1895.
[3] Lancet, Jan. 18, 1896.
[4] Med. News, Aug. 24 and 31, 1895.

and hypnotic suggestion has only ended in defeat. After this we would expect his implied caution as to commanding a bedridden patient to walk. He plainly says that such a command, with failure, means double injury to the case, and that only a wide experience with hysteria will enable one to select the cases for abrupt exercise of authoritative influence. [We dwell upon this because it accords perfectly with our own experience and judgment that in the overwhelming majority of cases of hysteria the most is accomplished by rational, systematic, and continued treatment.]

The one entirely novel fact in the paper, so far as we know, is that in contracture with extreme flexion of the thigh there is often severe pain in the foot caused by the stretching of the sciatic nerve over the edge of the sciatic notch. This assumption as to the origin of the pain is supported by the results of treatment, for in the author's experience extension of the thigh has at once relieved the pain, although it was frequently necessary to divide the tendons to accomplish this.

Among some of the more unusual symptoms due to hysteria, and noted by the author, we think it profitable to mention the following, as they are likely to mislead physicians to a diagnosis of organic disease: incontinence of urine and feces, temperature from 95° to 101°, pulse 130 to 180, respirations too rapid to count, movement of one eye independent of the other, extreme emaciation (child of 11 years weighing 45 pounds), loss of speech, sight, taste, and feeling. One case communicated for a time entirely by means of the eyelids. Loss of pupillary reaction to light and almost complete loss of erections were also noted.

The conclusion of the paper is as follows: "But, whatever the cause, I have seen hysterical contractions in which, after section of tendons, the joints were too much altered to admit of useful restoration. The leg, bent at an angle of 45°, is brought, by section and the screw, to a much larger angle, but cannot be made straight enough for use. There is motion within limits, but with weak muscles and bent legs the effort needed for walking becomes excessive. Under these circumstances crutches are essential, and there may arise a question as to the propriety of making the leg straight by an operation that will leave it rigid. Above all, I desire to impress upon you, finally, that a contracted limb is not a limb to confide to the rare relief brought or not brought by time.

"I have desired to call attention to this paper to certain hitherto unnoticed clinical facts: 1. Two forms of hysterical contracture exist. One concerns single parts and limited groups of muscles. In this the contracture may last for years without the addition of organic changes in muscles, joints, or interstitial tissues. In this also sudden cessation of contracture is possible. 2. A form of contracture exists which attacks in succession one limb after another, until soon or late all or nearly all the voluntary muscles, as well as those of the trunk, may become involved. The cases of this group do not, in my experience, ever get well abruptly. In them the muscles, joints, and areolar tissues undergo serious organic changes.

"In the first or limited form the muscles and the muscular reflexes remain unaltered or are but little changed, and mechanical and electric responses continue to be normal or nearly so. In the second or generalized form the reflexes are lost or interfered with late in the disorder, and the electric responses are quantitatively lessened, and may, in time, be almost altogether lost. It is only in this form, after years of life in bed, that we may expect to see changes in the cord. Whether these are merely independent accidents, or are the rare secondary products of the hysterical condition or of the organic changes this occasions in the peripheral nerves and muscles, we do not yet know."

Hysteric Spasm of the Trunk-muscles.—Janet[1] calls attention to a manifestation of hysteria that has scarcely been mentioned by writers on the subject, but which, he thinks, cannot be very rare, as he is able to report 8 personal cases. This new symptom-group of the "great neurosis" consists of a contracture of the muscles of the trunk—sometimes a few, sometimes nearly all, including the diaphragm. The onset is usually acute, and the contracture may be sufficiently intense to cause not only great pain and induce vicious attitudes, but also to produce various digestive and respiratory troubles, so that the affection may simulate some visceral disease. The following condensed report of 1 of his cases will illustrate: A decidedly hysteric woman, aged 32, was apparently attacked by some acute febrile disease. She complained of headache, backache, and respiratory oppression. The face was pale and drawn, the lips dry, the tongue pasty; respiration was apparently difficult and 45 per minute. Although the pulse was only 75, the temperature 100.7°, and physical examination negative, a diagnosis of acute bronchitis, or perhaps grip, was made and the patient treated accordingly. At the end of a week there was but little change. The temperature was normal and physical examination negative, but there were anorexia, insomnia, constipation, coated tongue, dyspnea, and anxiety. It was now learned that the attack had followed a fit of anger, and examination revealed all the thoracic and abdominal muscles tensely contracted and very tender. The trunk was so fixed that deep inspiration, sighing, and yawning were impossible. The constipation, dyspnea, pains, etc. were also due to contracture, and disappeared as soon as the muscles were restored to their normal condition. In another case, also a markedly hysteric subject, following some emotion or slight shock the trunk would become rigid, almost immovable, respiration rapid, shallow, and almost exclusively superior costal. She would be unable to stoop or even nod or turn the head: she could not take a full breath, cough, yawn, or laugh, and complained that she was compelled to cry in complete silence. The urine had to be drawn, and defecation occurred only once in 2 weeks.

When hysteric patients complain of a smothering sensation, that the chest feels as if in a vice, of extreme constipation, difficult digestion, etc., this condition of contracture should be sought. The patient is asked to assume divers positions of the trunk, execute various movements, and to take deep inspira-

[1] France méd., Dec. 6, 1895.

tions, when it may be found that some of these movements cannot be executed on account of rigid and painful muscles that may at times be seen and felt. The best treatment is massage, which may be employed even when the parts are intensely hyperesthetic if it be begun with extreme gentleness. The muscles are ordinarily not tender at first, but just before they cede to the treatment they become tender and painful, which is thus to be regarded as of favorable import. The treatment is not to be discontinued while the least contracture remains, for such residue may be the point of departure for renewed attacks. Immediately following the cessation of the contracture the patient feels sore, and must for some time avoid quick movements which might also determine a relapse. Aside from the mechanical action on the muscles, massage acts in part by the mental impression it produces; it is more efficient during hypnosis, may succeed when given by one person, fail when given by another, and is ineffective when used by the patient himself. The fundamental treatment of this, as of all hysteric manifestations, must be the rational treatment of the neurosis itself.

Hare[1] reports a case quite similar to those of Janet. A boy of 19 had very severe spasms of pain in the abdomen, which came on every day in the late afternoon or early evening. The time of the attacks is quite characteristic of hysteria. The tongue was heavily furred, and digestion was evidently greatly impaired. On examination both recti muscles were found in a state of rigid contraction, and when touched developed a rhythmic spasm of a rate of about 60 per minute. Under anesthesia the spasm promptly disappeared, and the boy rapidly recovered under gastric lavage and antiseptics. [The question naturally arises whether the gastric trouble was due to the muscular rigidity, as Janet would hold, or the spasm due to toxemia from the gastric fermentation, as occurs in some cases of tetany.] (See *Tetany.*)

Hysteria and Tetany.—[Although hysteria may in its manifestations closely simulate tetany, it should be clearly understood that they are perfectly distinct and entirely different diseases, and Grace Peckham Murray[2] commits a solecism in reporting 3 cases of "hysterical tetany." They were better called hysteric pseudotetany, or, perhaps better still, tetanoid hysteria, as they are cases of hysteria pure and simple.]

Hysteria in Children.—[It is not new that hysteria may affect children, and very young children, but they have very generally been thought to be refractory to the convulsive form of the disease. There is a general, though false, impression too that convulsive hysteria is almost confined to the Latin races, especially the French.] It is instructive, therefore, to know that Fürstner,[3] a German, has observed a number of cases of hysterical convulsions in children under 7, and has made extended observations of 11 cases between the ages of 9 and 16. In both of these groups boys were more frequently affected than girls. The convulsions varied greatly in character, some being frankly hysterical and others closely resembling epilepsy. One boy had fits exceed-

[1] Medicine, July, 1896.

[2] Med Rec., Mar. 21, 1896.

[3] Arch. f. Psych., Bd. xxviii. H. 2.

ingly like procursive epilepsy, and in quite a number of patients the spasms succeeded one another with such rapidity as to closely simulate status epilepticus. The entire differential diagnosis cannot be entered into here, and we confine ourselves to a very few traits. The spurious (hysteric) status does not induce the extreme physical prostration and mental torpor characteristic of status epilepticus. Bromids are absolutely without effect, and Fürstner insists that they produce drowsiness and hebetude with pathologic rapidity. The movements in the convulsion are much larger and more irregular (writhing) than in epilepsy, although they do not attain to the systematic purposiveness seen in adults. Characteristic is also the fact that the little patients have, with great frequency, an unconquerable distaste for food and in consequence may become greatly emaciated. [Fürstner does not mention the fact, but rebellious vomiting or regurgitation is often an accompaniment of this anorexia.[1]]

Hysteric Breast.[2]—The organ is enlarged and very sensitive, particularly the integument, but the affection is one of exacerbations, and between the attacks the breast may be almost normal. During an attack the hyperesthesia may be so intense as to make the mere contact of clothing unbearable, and there are vasomotor disturbances varying from simple congestion to marked edema or even cutaneous gangrene. At the same time the breast is the seat of prickling, burning, or lancinating pain, and may swell to double the normal size. The exacerbations are caused by such influences as ordinarily induce hysteric attacks—intense emotion, menstruation, etc.—and at the height there may be a more or less pronounced convulsion. The appearance of the integument is variable: there may be white, red, or cyanotic edema. The diagnosis is not always easy in the intervals, but is much more difficult during an attack, as all palpation is impossible. The superficial gangrene has occasionally been followed by secondary infection, suppuration, swelling of the axillary glands, etc.

Polyesthesia and Macroesthesia.—Stcherbak and Ivanoff[3] have reported a case of polyneuritis and hysteria presenting curious sensory manifestations in the distribution of the right median nerve. A body touched or held with the thumb and the adjoining two fingers felt larger than it actually was (macroesthesia), and at the same time it seemed as if several bodies of the same kind were felt (polyesthesia). At different times varying sizes and numbers were appreciated. The phenomenon could not be elicited elsewhere than in the region named. Its advent had been preceded by severe pains, paresthesia, and trophic changes, particularly in the distribution of the right median nerve. The paresthesia continued in association with the polyesthesia and macroesthesia, and disappeared with them. There was also impairment of both tactile and muscular sensibility in the affected area.

Neurotic Vomiting.—[It was noted in the *Year-Book* for 1896, p. 660,

[1] See Hysteric Anorexia in the *Year-Book* for 1896, and also the Diagnosis of Hystero-epilepsy by one of us (H. T. P.), N. Am. Pract., July, 1896.

[2] Gilles de la Tourette, Nouv. Icon. de la Salp., vol. viii. p. 107.

[3] Arch. de Méd. exper. et d'Anat. path., 1895, p. 657; Med. News, Nov. 2, 1895.

that in hysteric anorexia and vomiting the patient may not only become emaciated in the extreme, but may even die of inanition.] Edes[1] in a very suggestive paper reports 2 cases with fatal termination. In neither case did the very careful postmortem examination reveal any cause for the vomiting or death. He also reports a third case, in which death seemed imminent, but in which the patient recovered. [All 3 cases seem to confirm the hypothesis advanced by Brissaud and Souques (see *Year-Book* for 1896, p. 660) that the trouble is essentially a mental disease, and that the patient is the victim of a subconscious imperative conception (ideé fixe subconsciente). Indeed, Edes seems to have come to a similar conclusion, as the following remarks will indicate:] "The act of vomiting is to a certain very limited extent directly under the control of the will, but much more completely is it, together with the whole process of digestion, indirectly subject to nervous influence." "How easy it is to disgust a sensitive person with any article of food by some unpleasant detail as to its source or method of its preparation! It is certainly consonant with the views of hysteria held by some theorists that a fixed idea or some incident forgotten as to ordinary consciousness, but retained in the subliminal, may be constantly exciting the centers controlling the action of the stomach. In the second of the cases reported it is more than probable that the idea of the patient that she was not going to get well had a good deal to do with determining the result. If the patient believes that she must vomit, she will do so; if, on the other hand, there are no nerve-endings in the gastric mucous membrane irritated by inflammation or neoplasm, no cells in the medulla to be compressed or poisoned, assurances that she need not and must not vomit are of more value than bismuth, creasote, or ice. One gentleman proposes to check hysteric vomiting by the simple plan of bringing no basin."

Dubois[2] reports 3 cases of hysteric anorexia treated principally by hypodermic injections of morphin. He gives large doses, enough to relieve all pain and quiet the stomach—indeed, to partly narcotize the patient—and gives food one-half hour after the injection. Positive assurances are made to the patient at the same time. The doses are then gradually decreased until the solution used contains none of the drug. [The author claims unusually good results from this treatment, but we would be slow to recommend it, and certainly should not use it until less objectionable methods had failed.]

Irritable Spine.—Gibney[3] gives his treatment of irritable spine. [This term, by the way, we, with him, prefer to spinal irritation.] He [properly] confines this term entirely to cases of a functional character when there is no organic disease of the spinal cord or column. The treatment embraces the Paquelin cautery, blisters, massage, hydrotherapy, and static electricity, all of which are old and useful measures. Something new is the application of strips of adhesive plaster, 4 × 1 in., obliquely criss-cross along the spine. These means failing, he applies a light brace, which often affords great relief, although he does not report a case so cured. [Although the author insists that

[1] Canad. Pract., Jan., 1896.

[2] Progrès méd., Feb. 22, 1896.

[3] Med. Rec., May 9, 1896.

the cases are functional and at times of an hysterical nature, he does not seem to appreciate that they are generally *psychic*, and he has apparently not noticed the rapid shifting of tender points that can nearly always be demonstrated. (See Diagnosis of Hysteria.)]

Voluntary Dilatation of the Pupil.—It is said that some persons can cause the pupil to dilate by producing the mental image of a dark room, and Brücke has mentioned a physician who could dilate the pupil without this aid. These cases excepted, we believe the case reported by Bechterew[1] to be unique. A nervous woman of 37, after an attack of right temporal pain, noticed that the right pupil was dilated. This was repeated several times, and she then discovered that she could voluntarily dilate it. The dilatation always followed close work, and was regularly present during the 3 days preceding menstruation. [We know of a case in which dilatation of one pupil always accompanies menstruation.]

Booth[2] reports a case of **mydriasis cured by hypnotism.** It was unilateral and disappeared after 7 sittings. Three months later the other eye presented the same condition, and was cured in the same way.

Epilepsy.—[In the *Year-Book* for 1896 we reported upon **the Flechsig treatment** of epilepsy, and another year's experience has confirmed the opinion then expressed that it constitutes an addition to the therapeutics of this disease.] Of more recent communications we may mention that of Nearro,[3] who reports 7 cases. All of the patients improved, and in some the result was brilliant. For instance, one, an imbecile, who under the bromid treatment was having 4 or 5 fits a day, had no attacks in the 6 months following the beginning of the Flechsig treatment. Wolfe[4] reports very fully the case of a girl aged 14 who had gradually grown worse under all methods of treatment, including bromids up to 600 gr. a day, but who at once improved under this treatment (with $\frac{1}{100}$ gr. of atropin added to the bromid), and for 9 weeks preceding the report had not had a fit. Lui[5] reports very good results from the Flechsig treatment. The fits ceased for a variable length of time, and even after their return the duration and frequency of the attacks were not so great. In 10 cases **Bechterew's treatment**—a combination of bromid, adonis vernalis, and codein (see *Year-Book* for 1896)—was used with uniformly good results. In some cases the attacks ceased; in others there was only a diminution in their violence and frequency. Neither of the methods seemed to have any effect on the mental state. Pellizzi[6] treated 25 cases with Bechterew's formula. In no instance did the fits cease, and the author concluded that the treatment was efficacious exactly in proportion to the amount of bromid administered. Guicciardi[7] came to the same conclusions, but found that the bromid was better tolerated in this combination than when given alone. Taty[8] made

[1] Deutsch. Zeit. f. Nerv., 1895, Bd. vii. p. 478.
[2] Am. Med.-Surg. Bull., Nov. 1, 1895.
[3] Jour. Nerv. and Ment. Dis., May, 1896.
[4] Charlotte Med. Jour., July, 1895.
[5] Riv. Sperim., 1895, xxi. p. 364.
[6] Ann. di Freniat., 1895.
[7] Riv. Sperim., 1895, xxi. p. 371.
[8] Lyon méd., Dec. 29, 1895, and Jan. 5, 1895. The subject is continued in the number for Jan. 12, which we have been unable to obtain.

a very careful study of the Bechterew treatment in 17 cases. He began with moderate doses, increased about one-fourth at the end of a week and again at the end of the second week, giving as the maximum about 40 gr. of adonis vernalis, 128 gr. of potassium bromid, and 2 gr. of codein in the 24 hours. In the majority of the cases there was an improvement in the frequency and severity of the convulsions, but in a few the effect was *nil*. Sudden cessation of the mixture had the same effect as sudden withdrawal of bromids in causing a rapid recurrence of fits. In quite a goodly proportion of the cases the treatment caused such marked somnolence that it had to be stopped. In short, the bad effects of the bromids were manifest, except the dangerous and homicidal impulses that are observed in connection with the straight bromid treatment, especially on its sudden cessation.

Trional in Epilepsy.—Among the more recent medicaments employed in epilepsy is trional. Boyer[1] reports from the service of Weir Mitchell 13 cases treated by this drug. In all but 1 there was some improvement; in some the remedy accomplished distinctly more than the bromids, and in 1 or 2 the result might be called brilliant. One child was having as many as 5 fits a day, but under trional had none for 6 months, and was, besides, cured of a chorea of 3 years' standing. The conclusion is, that trional may not supplant the bromids, but may be useful in such patients as are not improved by them or when a change of treatment is for any reason desirable.

Potts[2] from the treatment of 17 cases with **horse-nettle** (*Solanum carolinense*) concludes—1. That the drug has a decided influence for good upon the epileptic paroxysm; 2. That this influence is probably not so great or so sure as that obtained by the use of antipyrin and the bromid salts, or even of the mixed bromids; 3. That in those cases in which it is of service it relieves the paroxysms without causing unpleasant symptoms, such as are sometimes caused by the use of large doses of the bromids; 4. That the dose ordinarily recommended (10 to 15 drops of fluid extract) is too small, and that as much as a teaspoonful or more 4 times daily is often needed to secure results. Mackid[3] reports the case of a child of 11, the subject of epilepsy for 3 years, who was having almost daily fits, and had as many as 12 in one day, who was apparently cured (time not stated) by fluid extract of horse-nettle, increased to 1 fluidounce 3 times a day, and afterward 4 oz. once a week.

Peterson[4] considers, among other things, some of the more **recent proposals in the therapy of epilepsy.** Regarding some of the drugs he says: "In the first place, there is **simulo,** a South American plant of the hyssop family, the tincture of which is given in doses of 1 to 2 or 3 drams 3 times daily. After an experience in many cases for several years, I would say of simulo that it deserves trial in most cases; that it is perfectly harmless, which cannot be said of the bromids, borax, belladonna, and some other drugs; that in a few cases it has been extremely beneficial in my hands, and that in most cases it has no effect at all. *Solanum carolinense,* or horse-

[1] Univ. Med. Mag., Mar., 1896.
[2] Therap. Gaz., Dec. 16, 1895.
[3] Therap. Notes, June, 1896.
[4] N. Y. Med. Jour., June 6, 1896.

nettle, has in my practice proved of no value whatever. The so-called bromid treatment of **Flechsig** is of great use for many patients, especially in old and obstinate cases when all other agents have proved ineffectual. This treatment consists of the administration of opium for some 6 weeks, beginning with ½ to 1 gr. 3 times daily, and increasing daily until 10 to 15 gr. a day are taken, when the use of opium is suddenly stopped and bromids in large and gradually reduced doses are given (30 gr. 4 times daily to begin with). I had used in certain cases of epilepsy for some years codein with considerable success, but this combination of the opiate with bromids is still more satisfactory. *Adonis vernalis* conjoined with the bromids, as recently suggested by Bechterew, is an efficient method of treatment, from which in several instances I have had gratifying results. Digitalis, which has properties similar to *Adonis vernalis*, was formerly frequently given in epilepsy, but the new combination seems to be much more efficacious."

He further says: "There are a few cases of epilepsy in which careful investigation indicates self-intoxication as a factor. In these an excess of ethereal sulphates (indican) in the urine, together with periodical or constant attacks of gaseous diarrhea, are almost positive manifestations of putrefactive or fermentative changes taking place in the alimentary tract. It is remarkable how much benefit may be obtained in such patients by the regulation of the diet (milk and its modifications, kumyss, matzoon, somal, rare or raw beef, eggs, green vegetables, and special breadstuffs, like zwieback, Huntley & Palmer's breakfast biscuits, and Voebt's *biscotte de légumine*); by the frequent drinking of hot water, and the occasional flushing out of the large intestine by hot water; and by the use of certain intestinal antiseptics given 2 hours after meals, such as betanaphtol, salol, salicylate of sodium, and peppermint. The remarkable effects of the thyreoid extract upon general nutrition would naturally suggest the advisability of its administration for experimental purposes in some of the nervous diseases which we are accustomed to look upon as due to nutritional disturbances in the nervous system. With this idea in view I have been treating with thyreoid extract 10 epileptic patients selected as showing a specially obstinate form of the disease and having frequent attacks daily. In all of them there was a loss of weight. In 9 of them there was no apparent effect. In 1 case, however, the result was brilliant enough to justify its trial for a longer time in other cases. In the 6 weeks now elapsed since the treatment was begun the patient has had no attacks, although previously, under any sort of treatment, he averaged 2 or 3 daily."

Regarding so-called **reflex epilepsy** he submits the following: "1. Reflex epilepsy is so rare that the proportion of cases in which a reflex cause will be found is certainly not above 1 or 2 in 1000. 2. In chronic cases, where the epilepsy has had its origin in a reflex cause, the convulsive habit has become so strong that removal of the reflex irritation will seldom alter the course of the disease. 3. There are surprisingly few cases on record in which an operation of any kind whatever for the relief of so-called reflex causes has induced a cure of the epilepsy. I think authentic and trustworthy instances

of the kind recorded in literature could easily be counted upon the fingers. Bearing these points in mind, the practitioner may perform his gynecological operations, circumcise, carry out procedures on the nose, tamper with the eye-muscles, or what not, but let him not be too sanguine of a successful issue. He will be fortunate indeed to meet with a single success."

[It is, perhaps, but just to say that Ranney, a great apostle of the treatment of epilepsy by graduated tenotomies of the eye-muscles, has taken violent exception to these postulates. It is also but just to say that he is supported by exceedingly few good observers.]

As to the value of brain-operations for epilepsy Peterson sums up as follows: "1. In about 1% of all cases of epilepsy an injury to the head will be found to be the original cause. 2. In a much larger percentage an old meningeal hemorrhage, congenital or acquired in infancy, giving rise, in addition to the epilepsy, to various degrees of paralysis, idiocy, or other cerebral symptoms, and presenting, on examination, brain-atrophy, sclerosis, and cysts as sequelæ to the primary lesion, will be ascertained to be the cause. 3. In the present state of our knowledge and experience those cases due to meningeal hemorrhage should not be operated on at all. 4. In the very small number of cases having injury to the head as a cause the epileptic habit is so strong and the changes in the brain are usually so old and deep-seated that an operation, as a rule, does not cure, and only seldom permanently diminishes the frequency of the attacks. 5. Of miscellaneous traumatic cases where a surgical procedure seems justifiable and is undertaken, a cure may be reasonably expected in perhaps 4 out of every 100 cases operated upon. 6. The removal of a cicatrix from the cortex supposed to be the epileptogenic nidus will naturally be followed by the formation of a new cicatrix in the surgical wound, and is scarcely a defensible procedure. 7. The more recent the injury the greater will be the promise of lasting benefit. If 100 cases of epilepsy could be selected in which the trauma dated but a few months back, trephining and ablation of the morbid tissues would doubtless prove curative in a very large percentage of cases."

Trephining for Epilepsy.—Mason[1] tabulates from the literature 26 cases of trephining for epilepsy, in addition to his former table of 44.[2] Of these 26, only 1 can be regarded as cured, 4 improved, and 1 is doubtful. The remainder, 77% of the whole, were either unimproved or the time elapsed after the operation was too short to allow of conclusions. Of the entire 70, the author reckons only 3 as cured and 6 improved. Of the 26, none died from the operation; of the 44, 3 were fatal. The following principles enunciated by the author are not particularly new, but, we think, fairly represent the best neurologists and surgeons of to-day: "1. Always consider an epileptic fit as a symptom of some underlying condition. 2. Inquire particularly and very carefully about the first convulsion: What was its apparent exciting cause; what was its character, general or affecting only certain portions of the body; and what portion of the body was affected at the beginning of the fit? 3. If there

[1] Med. News, Mar. 21, 1896. [2] Nerv. Dis. by Am. Authors, pp. 304–311.

was an aura, investigate it carefully, as it will not infrequently give a clue as to the seat of the lesion. 4. If there has been a trauma or a suspicion of trauma, shave the head and look carefully for a scar or a depression. If there is evidence of a trauma in a position corresponding to the initial symptoms of the fit, an operation is usually justifiable. 5. If you cannot get a clear history of the case, give a placebo and place the patient under competent surveillance until you can satisfy yourself as to the character of the fits. 6. Do not operate on a porencephalic child and expect to cure the epilepsy. Do not, as a rule, operate on a case of posthemiplegic epilepsy in a child and expect to cure. 7. Do not operate on an old, idiotic epileptic, a victim of idiopathic epilepsy, with general convulsions of years' standing. What, then, is the value of operative interference in the treatment of epilepsy? In the light of our present experience I think it will be fair to put it thus: *a*. A certain small percentage of the cases will be cured. *b*. A certain larger percentage will be improved. *c*. An even larger percentage still will not be improved at all. *d*. An operation upon almost any case will produce a temporary cessation of fits."

In such a case as that reported by Turner[1] there could not be two opinions as to the advisability of operation: A seaman had been struck on the head 4 years previously by a large iron hook, rendering him unconscious for 7 days and inflicting a depressed fracture of the vertex. After the immediate effects of the traumatism had disappeared he was left with hemiparesis of the left side, constant headache and drowsiness, defective vision and speech, and subject to frequent epileptoid convulsions of the Jacksonian type. Examination revealed a transverse depression a little anterior to the lambdoidal suture, large enough to receive the tips of 3 fingers to a depth of $\frac{1}{2}$ in.; also a discharging sinus at the inferior angle of the right parietal bone, through which a probe passed inside the skull and 4 in. toward the depression. Operation disclosed an epidural abscess, which was evacuated, the walls were curetted, a sequestrum of the inner table removed, and the patient went on to complete recovery from both paresis and epilepsy; at least there had been no recurrence 2 months after operation.

Epileptoid Fits from Autointoxication.[2]—A man of 50 who suffered from chronic constipation would become, about once a week, incapable of mental effort, dizzy, and have a full feeling in the head. Once a month to once in 6 months he would have more severe attacks—would rise in the morning in a semi-delirious state, be very irritable, and later have a typical epileptoid convulsion. General treatment was of no avail, but on Hunyadi water on rising, with a pill of ext. chiretta gr. 2, leptandrin gr. $\frac{1}{2}$, podophyllin gr. $\frac{1}{5}$, euonymin gr. $\frac{1}{2}$, creasote gr. $\frac{1}{2}$, he fully recovered, and during 9 months of observation had no further trouble.

Neuralgia.—Dana, at the last meeting (1896) of the Association of American Physicians,[3] advocated a treatment of tic douloureux of which the hypodermic injection of strychnin constitutes the most active part. The injections

[1] Lancet, Jan. 11, 1896.

[2] Hare, Medicine, July, 1896.

[3] Boston M. and S. Jour., July 2, 1896.

are made once a day, and the dose is gradually increased from $\frac{1}{30}$ gr. to $\frac{1}{5}$ or $\frac{1}{4}$ gr., 10 to 20 days being required to reach this maximum. He says that the large doses sometimes have an immediate anodyne effect like that of morphin, and indeed these were the cases that showed the best results of the treatment. In a few instances the strychnin seemed to temporarily increase the pain, but this was rare. Six cases (another report says 8) were reported, 2 in women, 4 in men, and all were relieved but 1. The ages of the patients ranged from 43 to 73 years, and the duration of the disease before the treatment was begun averaged 6 years. As adjuvants to the injections the author used potassium iodid and iron, rest in bed, light diet, and diluents. The period of relief in the 5 cases had been from $1\frac{1}{2}$ to 2 years. In the discussion Putnam said he had been moderately successful with aconitin, but would be glad to try the new method. Janeway said it was very difficult to get reliable aconitin, but when a good article was used the results were often very good. Sinkler thought the accessory treatment used, the rest in bed at an even temperature, removal from worry, and the like, would of themselves account for considerable improvement. In answer to questions Dr. Dana said he thought suggestion might have had something to do with the results; he had never seen any ill or peculiar effect upon the mind. He considered the element of rest important, but 1 or 2 of the cases had recovered without taking much rest. He did not pretend to explain the good results of the treatment, but the good results were obtained. Most of the cases reported had received all manner of drugs before the treatment indicated was tried. Hunsberger[1] used aconitin in 57 cases of various kinds of neuralgia, and thinks it superior to any other remedy, even operation. In trigeminal neuralgia he gives $\frac{1}{200}$ gr. every 2 hours, and has never seen any injurious effects—no depressive action on the heart, and none of the unpleasant symptoms produced by morphin, atropin, and other alkaloids. In intercostal and visceral neuralgias he finds the remedy particularly efficient, due, in part, to the fact that it does not irritate the digestive tract. In sciatica he gives the drug in small doses for 2 months, and repeats this course after an interval of 2 weeks. Seagrave[2] advocates the injection of cocain for all kinds of neuralgia, as well as for all cases of muscular rheumatism. The solution is introduced over the seat of the pain, except in neuralgia of the head and face, when the injection is made into the arm. They are used as often as the pain returns. The author says: "The markedly good results obtained by injecting cocain into the arm for neuralgia of the head and face cannot, however, be explained on the ground of its local anesthetic effect, and must probably be due to vasomotor influence. That it does act like a charm in many such cases in which all other drugs, morphin included, have failed, my own personal experiences enable me to affirm. In no cases have I seen dangerous symptoms arise from the use of the drug, and in only very few have I observed slight temporary discomfort." [The author says nothing of the formation of the cocain-habit, but we would consider this a real danger and a valid objection to the treatment, except in emergencies and hopeless cases

[1] Therap. Gaz., Aug. 15, 1895.

[2] Brit. Med. Jour., Feb. 8, 1896.

in which morphin would otherwise have to be resorted to.] Nencki and Jaworski[1] have found apolysin of decided value in neuralgia. They have given this name to a new compound chemically of the same group as phenacetin. The dose is from 2 to 15 gr. 3 times a day, and no unpleasant effects were observed; but the drug is contraindicated when the stomach is empty or in a hyperacid condition.

Sciatica.—Negro[2] has reported 113 cases of rebellious sciatica treated by compression, all of which ended in recovery. The procedure is as follows: The patient lies on his face with his legs extended and resting easily one against the other. The most painful spot is selected, the region where the nerve proceeds from the large sciatic opening. On its trunk both thumbs are applied, and it is compressed with the greatest possible force; at the same time slight lateral movements are made without changing the point of pressure or moderating its intensity. This takes from 15 to 20 seconds, and is followed by an interval of 20 minutes' rest, when the procedure is repeated. After a second application, which is much less painful than the first, the patient is able to walk, and for several hours, or even a day, he may be free from pain. In order to obtain complete recovery, says the author, this procedure should be practised about 6 times a day every 2 days, until the definite suppression of the neuralgia is obtained. Monell[3] reports 9 cases treated by static electricity. He used sparks from a ball electrode over the painful points and along the nerve, and the results as reported are certainly remarkably good.

Reflex Neuroses.—The paper by Knapp[4] on this subject is so well arranged and condensed that an abstract is almost impossible, and we content ourselves with a few extracts. [The opinions and conclusions of the author may be taken as fairly representative of the position of the best neurologists upon this important and much-agitated question.] "In order definitely to determine whether the doctrine of reflex neuroses is one which can be accepted, we must first define it. It may be fairly stated, I think, in this way: A slight change occurs in some organ, not sufficient to attract particular attention to the organ itself, to interfere materially with its functions, or to cause noticeable pain or discomfort in it. This change irritates the terminal sensory nerves of the affected organ, and the irritation is communicated to connecting fibres of the ganglionic or spinal nerves, and thus conveyed to a distant organ, which may be anatomically healthy. This irritation may excite in the distant organ phenomena which simulate a morbid condition in it, the organ responding 'most violently to this slight abnormity, as the alarm-gong sounds in answer to the tap on the button of the distant station.'"[5]

"We have all of us heard how the gynecologist has seen 'an agonizing asthma cease shortly after the placing of a pessary, intense cardiac pains and insomnia vanish upon the insertion of a tampon, and a single application of

[1] Abst. in Yale Med. Jour., Feb., 1896.

[2] Bull. méd. de Paris, Jan. 22, 1896; N. Y. Med. Jour., Feb. 29, 1896.

[3] Brooklyn Med. Jour., Apr., 1896. [4] Am. Jour. Med. Sci., Oct., 1895.

[5] Engelmann, "The Hystero-neuroses," Mann's System of Gynæcology, ii. 59.

electricity cause a violent dyspnea, with great nervous depression, to disappear even during the application, whilst the patient was still upon the table, though haunted by suffering and reduced to invalidism for over two years. . . . . Even violent psychoses, such as mania, melancholia, and epilepsy, will disappear completely upon relief of the uterine lesion.'[1] Few of us, however, have met with such cases in our own practice, and they seem to be growing much rarer. In my own experience I do not recall a case where the nervous condition was materially benefited by treatment of the pelvic organs unless there were definite local symptoms of pelvic disease; and even with actual local disease the treatment of the nervous conditions may greatly relieve the local symptoms."

"When in the discussion before the Association of American Physicians in 1891, where the neurological side was so ably sustained by your president, Dr. Lusk could say that he was 'tempted to assert that the performance of normal ovariotomy for epilepsy and insanity is to be regarded as hardly better than malpractice,' we may conclude that the operation is following the course of the 'star of empire,' and is seldom performed in our Eastern cities."

"Granting that the hypothesis of reflex neuroses, as stated in the beginning of this paper, be sound, there are certain very remarkable peculiarities which remain to be explained. Why, for example, should disease of the ovary cause so much more nervous trouble, and so much oftener demand removal of the organ on account of the nervous trouble, than disease of the testicle, which has similar anatomical nervous relations? Why should an inflammation of the mucous membrane of the cervix uteri cause so much more nervous disturbance than a gleet? Why is the whole notion of reflex neuroses from uterine disease to-day decadent, while the doctrine of reflex neuroses from eye-strain is dominant? Why are the reflex neuroses from diseases of the nose coming into prominence, while the reflex neuroses from diseases of the larynx are seldom mentioned? Why do we so seldom hear of reflex nervous troubles from diseases of the joints? In all these cases there is equal reason to suppose an irritation of terminal sensory nerves, and in all these cases there is a communication between these nerves and other ganglionic or spinal nerves which can convey the irritation to a distant organ."

"Given a moderate error of refraction in the form of hypermetropia or astigmatism, or given insufficiency of some of the external muscles of the eye, it may be compensated by unusual effort of the muscles of accommodation or of the external muscle at fault. This unusual effort gives rise to the ordinary result of any unusual muscular effort—fatigue, a heavy feeling, and pain. Weir Mitchell long ago pointed out the influence of errors of refraction in causing headache, and cases of headache from this cause are met with daily by all of us. Like most neurologists, I have made it almost a routine practice to refer all patients with obstinate headache to an oculist, and often with satisfactory results. Unfortunately, however, even when an error of refraction or a muscular insufficiency is present, the treatment of the ocular condition does not inevitably lead to a cure, and I have more than once had to regret my

[1] Engelmann, loc. cit., p. 80.

rash promise of relief after I had urged a pretty woman to wear the obnoxious glasses. Cases such as I have just cited, where every form of ocular treatment gave only temporary benefit, have not been unique in my experience, and it has sometimes happened, even where there was astigmatism or hypermetropia, that ocular treatment did no good at all."

"In a few cases of blepharospasm and habit-spasm affecting the muscles about the eye a correction of errors of refraction has given marked relief; in other cases, however, such correction has been of no avail. In most cases where there has been relief, in my experience, there has been a marked neurotic condition, and the trouble may have been of hysterical origin. It is possible, however, that with the extreme muscular effort at accommodation there may have been an overflow of nervous energy to the neighboring muscles."

"Stevens, however, and various writers since, have urged that eye-strain from errors of refraction was of much importance in the production of epilepsy, chorea, and other nervous affections. For a year I referred every case of chorea to an oculist, who corrected all errors that required it. In a few cases the ocular treatment relieved the headache, but it had no perceptible effect on the chorea. I may add that I had no belief that treatment of the eyes would cure the chorea, but I referred them to the oculist at his request. To attribute a disease of limited duration, occurring chiefly in neurotic children, and coming on most frequently in the spring, often attended with fever, endocarditis, and arthritis, and probably of infectious origin—to attribute such a disease as this to a permanent cause like eye-strain seems absurd."

"Epilepsy, much more than chorea, is one of the diseases which rests most distinctly upon a neurotic basis. It is, in fact, an indication of pretty profound degeneracy. The recent work of Chaslin, Van Gieson, and others indicates very strongly that it has a definite anatomical basis in processes of neuroglia-sclerosis in the brain-cortex. In spite of the benefit which is alleged by Dodd, Ranney, and others to follow treatment of the ocular conditions, it is asking too much to suppose that the degeneracy or the cortical changes are the result of astigmatism or any form of phoria. In epilepsy, as in other forms of nervous disease of degenerate type, various stigmata of degeneracy—cranial asymmetry, malformations of the ear, torus palatinus, anomalies of the genitals, etc.—are common. Astigmatism may itself be such a stigma, and the fact that in epileptics Féré has found astigmatism most marked on the same side as other physical deformities is certainly suggestive."

"There is a class of cases, however, where the reflex origin seems fairly probable—the cases of so-called reflex epilepsy. A critical examination of the cases reported under this head would certainly eliminate many of them. A considerable number of them are undoubtedly cases of hysteria, and in others the dependence of the epilepsy upon the alleged source of irritation is certainly doubtful. Nevertheless, the thesis that a remote irritation may give rise to convulsive seizures is supported by the well-known experiments of Brown-Séquard, producing epilepsy in the guinea-pig by injury of the sciatic,

and by a limited number of authentic cases in man. In most of these cases the source of the epilepsy has been of traumatic origin, and on removal of the irritation the epilepsy has ceased. These cases, however, are distinctly rare."

"In these cases it is possible that the constant irritation of the sensory nerves, associated, perhaps, with the shock of an injury, may finally result in a motor discharge, giving rise to a pure reflex epilepsy. Such cases, however, are rare, and further investigation is necessary."

"The following conclusions seem justified: 1. The essential feature in the production of many neuroses is the neuropathic state—the degeneracy of the subject. 2. In hysterical subjects suggestion plays an important part both in the development and in the cure of the symptoms. 3. Disease of any organ may give rise to referred pain in some definite area, but not to other nervous disturbances, except as a secondary result of local disease of the organ. This local disease manifests itself by the ordinary local symptoms, and the nervous phenomena are due to exhaustion, anemia, intoxications, etc. 4. In a few rare cases injury of a sensory nerve may give rise to epileptiform seizures. 5. Surgical operations for the relief of nervous symptoms should never be performed unless there are clear indications, apart from such symptoms, for an operation."

Akinesia Algera.—In the *Year-Book* for 1896, p. 600, reference was made to an exceedingly severe case of this affection reported by Erb, in which remarkable improvement had taken place, contrary to the rule. He more recently reports further improvement, indeed almost complete convalescence.[1] [This fact, together with the entire history of the case, would tend to show the correctness of our expressed opinion that the affection is not to be regarded as a pathologic entity, but only as "a manifestation of already well-known neuroses."]

Hiccough.—Lépine and Viaud[2] report a case of rebellious singultus (the latter physician being himself the sufferer) cured by protracted traction on the tongue. This maneuver resembles that recommended by Nothnagel—elevation of the hyoid bone—but is easier to execute. Bandhapadia[3] relieved a very severe case occurring in the course of remittent fever with bloody diarrhea by causing the patient to inhale the fumes of burning paper. [We have elsewhere seen notes of a case cured by the severe sneezing induced by snuffing capsicum into the nose, and we might mention that Matthieu recommends the sufferer to breathe vigorously and regularly from 45 to 50 times a minute. This expedient is said to sometimes arrest the most violent and persistent attacks.]

Birth-palsies.—[It is sufficiently well known that idiocy, imbecility, spastic paralysis, athetosis, and epilepsy are sometimes caused by injuries received by the babe in difficult labor. These lesions have been supposed to be principally meningeal and of the convexity, although hemorrhage or laceration of the centrum ovale is known to have occurred.] To better illuminate the patho-

[1] Deutsch. Zeit. f. Nerv., Bd. viii. H. 5 u. 6. [2] Prog. méd., May 16, 1896.
[3] Indian Med. Rec., Feb. 1, 1896.

logic anatomy of such cases Schultze[1] has examined the brain and spinal cord of such infants as died soon after prolonged or difficult labor, and reports 3 such cases. The result is interesting, inasmuch as no lesions whatever of the brain itself were discovered, and only slight hemorrhages between the dura and pia, but in the medulla oblongata and spinal cord there were distinct hemorrhages, some macroscopic, many more microscopic. There were also some lacerations in the substance of the cord, and the author [we think reasonably] concludes that such lesions must play an important role in some of the cases heretofore thought to be cerebral. Interesting also is the possible relation of such injuries to syringomyelia. The hemorrhages were most frequent and pronounced just in the location where syringomyelia ordinarily begins, and it is not difficult to suppose that such lesions at birth might later in life lead to processes which constitute the pathologic basis of syringomyelia.

Atypical Muscular Dystrophy.—Pearce[2] reports one of the atypical, possibly transition, cases of progressive muscular atrophy that are constantly coming to view now that a careful examination of such cases has become general. The patient, a married woman aged 59, had begun 27 years before to suffer from weakness of the third and fourth fingers of either hand. In a few years the process had extended sufficiently to produce double wrist-drop and difficulty in walking, the extensors being always affected earlier and to a greater degree than the flexors. Eighteen years after the onset she was examined by Weir Mitchell, who found that, although the weakness was widespread and marked, there was atrophy of the dorsal interossei only. There was partial reaction of degeneration. The paralysis continued to gradually increase in extent and degree until the patient was helpless, but the face was never affected and the neck-muscles to only a slight degree. Sensation was normal, there was no fibrillary twitching, and the mind was unaffected to the last. She finally died of pneumonia. The microscopic examination of the spinal cord, as well as that of the sciatic and median nerves, was entirely negative. The muscles showed atrophy, fatty degeneration, and other conditions characteristic of idiopathic muscular atrophy. [It is to be regretted that the terminal filaments of the motor nerves were not examined nor the cells of the cord by the Nissl method.] The case shows that muscular dystrophy (idiopathic muscular atrophy) may begin in adult life, affect first the small muscles of the hand, and present reaction of degeneration. The marked predominance of the extensors in the progress of the paralysis is also anomalous.

Treatment of Alcoholism.—Dunham[3] emphasizes the undoubted fact that treatment is ordinarily entirely too brief. It should extend over at least 2 or 3 months. In the acute stages he relies on bromid and chloral, with $\frac{1}{150}$ to $\frac{1}{100}$ gr. of hyoscin hydrobromate, when there is pronounced delirium and strong pulse. Hypodermic injections of strychnin sulphate or nitrate, with a little digitalin, are used to strengthen a weak heart, and they may also relieve the delirium. He also recommends the following tablet to be used hypoder-

[1] Deutsch. Zeit. f. Nerv., Bd. viii. H. 1. [2] Univ. Med. Mag., May, 1896.
[3] Quart. Jour. of Ineb., Oct., 1895.

mically: gold and sodium chlorid, $\frac{1}{24}$ gr.; strychnin nitrate, $\frac{1}{60}$ gr.; nitroglycerin, $\frac{1}{300}$ gr.; atropin sulphate, $\frac{1}{200}$ gr.; digitalin, $\frac{1}{60}$ gr.; sodium chlorid, $\frac{1}{8}$ gr. A platinum needle must be used, as the gold corrodes others. This formula is used in the acute and also in the chronic stage, and in the latter he gives in addition a tonic of nux vomica, hydrastis, capsicum, and infusion of gentian. In the after-treatment and the later conduct of the patient he insists upon total abstinence, instead of an effort to confine indulgence to beer and cider. [This is certainly the only rational plan. The foregoing, in addition to proper feeding, good hygiene, and the necessary treatment of complications, is, on the whole, a good method of treatment, but we should hope that no one would adopt it as routine. The formulæ are very good, but unnecessarily complicated—at least the proportion of the ingredients will need to be greatly varied to meet the requirements of individual cases.]

Thyroid Treatment of Myxedema and Cretinism.—[That administration of thyroid is the best, indeed the only treatment worthy of the name, for myxedema and cretinism, is unquestionable, but the constant query is, "Can they be cured, and will they not relapse even if the remedy be continued?"] Murray[1] thinks a favorable answer may now be given to these questions. He says, in substance: Myxedema is a symptom or combination of symptoms of loss of the function of the thyroid gland. In the idiopathic form it is a symptom of chronic interstitial thyroiditis, just as anasarca may be a symptom of renal disease or ascites of hepatic disease. The myxedema can be cured, although the chronic interstitial thyroiditis still remains. As myxedema is thus a symptom of thyroid inadequacy, it occurs not only as a result of removal of or fibrosis of the thyroid gland, but also in rare cases in consequence of other diseased conditions of the gland. In illustration of this, says Mr. Murray, 2 interesting cases which have been observed by Köhler may be mentioned. In one the myxedema developed in consequence of syphilitic disease of the thyroid gland, and as this improved under treatment by potassium iodid the myxedema disappeared. In the other the myxedema occurred as a result of actinomycosis which affected part of the thyroid gland. Great improvement in the myxedema followed the removal of the infected tissues by surgical measures.

In myxedema which accompanies fibrosis of the thyroid gland, we cannot restore the gland to its normal condition, but we can restore the patient to health if no incurable complication has arisen. For example, says the author, a gentleman, aged 44, who had suffered from myxedema for about $2\frac{1}{2}$ years, was sent to him 3 years ago. At that time he suffered from well-marked myxedema. He could scarcely walk half a mile and could undertake no work. Under treatment with thyroid extract rapid improvement took place, so that in 6 weeks the myxedema had almost entirely disappeared; 5 months later he wrote to say that he was quite cured. So complete has been the recovery of his mental and bodily capabilities that $1\frac{1}{2}$ years ago he was able to undertake the duties of secretary to a large manufacturing company, and not long afterward he was able to ascend a mountain over 3000 feet high, with a walk of 10

[1] Brit. Med. Jour., Feb. 8, 1896.

miles, without feeling much fatigue. A daily dose of 10 minims of thyroid extract is sufficient to keep him in good health.

In order to show that patients remain free from myxedema as long as they take thyroid extract and without any increase in the dose, the author refers to the first case in which the treatment was adopted. This patient, he says, was a woman of 46 who had suffered from myxedema for 4 or 5 years. There were well-marked swelling of the face, of the hands, and of the feet; dry skin, without perspiration; loss of hair; subnormal temperature; languor and slowness of speech and action. It is now $4\frac{1}{4}$ years since the treatment was first begun—in April, 1891. She gradually lost all the symptoms of myxedema, which, however, partly returned on 2 occasions when the use of the remedy was discontinued for a time. She has for a long time been free from myxedema, and is so now. The swelling has gone and the skin is soft and moist; the hair has grown again, the temperature is normal, and she leads an active life as the wife of a workingman. She continues to take a dram of thyroid extract during each week. As this patient remains well at the end of more than 4 years, it is evident that as long as she continues to take the extract she will not have myxedema, even if she lives for 20 years more. This continuance of good health in the adult, says Mr. Murray, gives us all the more reason to expect that cretins, if treated early and continuously, will also grow up and develop into normal adults. It will, of course, he says, take years to prove this, but he has brought forward these observations, as they help to show that in cretinism it is well worth while to persevere with the treatment year by year with this object in view.

Maxey[1] reports a typical case that improved with such rapidity that the patient was apparently well in 6 weeks. Bloom[2] reports a case showing recurrence on withdrawal of the remedy. The patient was a woman of 42, and was discharged cured after 72 days of treatment with thyroid. In less than a year she returned in the same condition as when first seen. Instead of the former treatment, she was now put on protonuclein, which seemed to act equally well, as she was again apparently cured in about $2\frac{1}{2}$ months. Fox[3] reports a case that was at first mistaken for anemia with edema, and rapidly grew worse on iron and nux vomica. Improvement on thyroid was marked, but even a few days' cessation of treatment caused her to lose ground.

[The cases of sporadic cretinism treated with thyroid during the last year are entirely too numerous to be cited in detail. The following instances, with illustrations, in addition to what has been said regarding myxedema, will suffice to show what may be expected from this comparatively new treatment. We must, however, caution against the careless and too liberal use of the remedy and against too sanguine expectations in old cases.] One of the brilliant results is reported by Noyes.[4] A child of 2 years had the appearance of an infant of 6 months, and was a typical myxedematous cretin. It was given at first 5 gr., afterward 1 gr., of thyroid extract per day, and at

[1] Med. Sentinel, Dec., 1895.
[2] Phila. Polyclinic, Dec. 28, 1895.
[3] Marat. Med. News, Nov., 1895.
[4] Jour. Nerv. and Ment. Dis., May, 1896.

the end of 5 months had grown 8 in. in length, gained from 3 to 4 lb. in weight, and exhibited great mental improvement. In the discussion of Noyes's paper Leszynsky reported a case in a man of 25, who acted like a child and who was but very little improved by thyroid. Fisher referred to a family of 3 cretins in whom the thyroid treatment was absolutely negative, but he had seen considerable improvement in intelligence, even in patients as old as 40. Haskovec's case[1] is somewhat unusual: A servant-girl of 36 was normal until the age of 8, when she began to grow stupid and gradually became weak-minded, could not be taught to read or write, developed a goiter, and at last became quite idiotic; her speech was almost unintelligible and she at times had delusions. During 9 months of observation in the asylum her condition remained unchanged, pulse and temperature subnormal. After the administration of thyroid was begun the temperature was slightly elevated, respirations accelerated, and pulse 84 to 132. She first became restless and irritable, then began to notice her surroundings, and finally became good-natured and greatly improved mentally. The goiter greatly diminished in size, but she rapidly lost weight and appetite, sweat much, began to vomit and grew very weak, so that the remedy had to be discontinued.

Plate 10 represents a case reported by Vinke.[2] A child of 6 years, about



FIGS. 131, 132.—Goitrous cretinism: 1, before treatment; 2, after 6 months' treatment (Parker).

the size of one of 2, was idiotic, could walk only a few steps, and presented the usual deformities of cretinism. The anterior fontanel was still open. On

[1] Wien. med. Woch., Oct. 26, 1895.

[2] Med. News, Mar. 21, 1896.

PLATE 10.



Sporadic cretinism. FIGS. 1, 2.—Appearance when treatment was begun. FIG. 3.—After five months' treatment with thyroid extract. (From photographs furnished by Dr. H. H. Vinke.)

thyroid there was immediate improvement. In 2 months he grew over an inch, lost 22 pounds in weight, did not sleep excessively, as he had done before, was mentally improved, and the fontanel was almost closed. At the end of 5 months he was still more improved in every way and the fontanel was closed, but he was still considerably in arrears of children of his age. Parker[1] records a remarkable case of cretinism with goiter. Figure 131 shows the child's condition at 18 years of age, at which time she was easily mistaken for a child of 2 or 3 years, weighed 36¼ lb., and was 33 in. long. She was given ½ of a 5-gr. tablet daily, and in 1 week had improved bodily and was able to say "dad," "mam," and "bab" for the first time in many years. By the end of the seventh week she had grown 1½ in. The dose was increased to 5 gr. a day, and at the end of 3½ months she could stand, which she had never been able to do. She continued to improve physically and mentally, got a new crop of hair, and cut 2 incisor teeth. Figure 132, from a photograph taken less than 6 months after the beginning of treatment, shows sufficiently well the physical and mental change.

Peterson and Bailey[2] report 7 personal cases and tabulate 40 from the literature. In none of these did the remedy fail to cause an improvement when properly and adequately given. The treatment presents less difficulty and danger in children than in adults. In addition to the great improvement in or disappearance of the myxedematous tissue, there has been, as a rule, a marked or even brilliant change in the mental and general physical condition, the child seeming to take up development at the point of arrest and growing afresh in body and mind. But it is the rarest exception, if indeed it has ever occurred, for the child to attain mental and bodily vigor equal to that of other children of the same age. In only a few has speech been acquired when it was previously absent. [Clearly, the time to begin the administration of thyroid extract in these cases is at the very earliest possible moment. Then, if long continued, there might be some hope of a real cure, which, so far as we have been able to learn, has not yet been recorded.]

Mercurial Multiple Neuritis.—Cases of pronounced multiple neuritis from the therapeutic use of mercury are rare, but are always possible, as the following 3 cases seen by Spillmann and Étienne[3] in 1 year will show. The first patient, a man of 35, contracted gonorrhea, and received therefor, from a druggist, some tablets and a "vegetable" syrup. At the end of 5 days he began to have symptoms of mercurial poisoning, and 18 days from the beginning of treatment he was found by the authors to present all the symptoms of severe multiple neuritis. Paralysis of all extremities was complete, and intense salivation, stomatitis, gingivitis, and puffy face showed clearly the kind of intoxication. The patient soon began to improve; in 3 weeks could walk a little, and at the end of 4 months was practically well. [It is well to note that in the period of convalescence the knee-jerks were exaggerated, for it is, perhaps, not sufficiently well known that in incipient and convalescent and

[1] Brit. Med. Jour., June 27, 1896.

[2] Pediatrics, May 1, 1896.

[3] Rev. de Méd., Dec. 10, 1895.

mild cases of peripheral neuritis the knee-jerks may be exaggerated.] It should be added that analysis of the tablets and syrup taken by the patient revealed a large proportion of mercury, and this metal was found in the saliva and in the urine even at the time of his discharge. The second case, a man of 25, contracted syphilis, and as soon as the roseola appeared began to take mercury. In 20 days he took 160 pills of protiodid [strength not stated] and made 11 mercurial inunctions. Almost immediately afterward the symptoms of neuritis appeared, apparently aggravated by exposure. At the end of 2 months he could not walk without support, presented marked incoordination, anesthesia, pain, tenderness, atrophy and loss of knee-jerks. After this he began to improve, but for 6 weeks suffered from severe pain and exquisite tenderness in the muscles. Six months later he could only walk about 200 yards, and it was more than a year before recovery was complete. The third case was treated by the authors themselves for active syphilis by means of intramuscular injections of thymol-acetate of mercury. From May 5 to June 9, 6 injections were given without any local disturbance. About the time of the last dose the patient began to complain of weakness, pain, and uncertainty of gait, and in a few days was the victim of well-developed neuritis of moderate severity. In a month he began to improve, and in another month was well. The authors cite 3 similar cases from the literature.

Neurotabes from Diphtheria.—Dejerine[1] reports a new case of typical pseudolocomotor ataxia. The neuritis in this case was caused by diphtheria and was of the purely sensory type. There was no weakness, no atrophy, and no electric change, but anesthesia, marked incoordination, and loss of reflexes. The affection lasted about 3½ months. Dejerine[2] also reports a case of multiple neuritis, apparently alcoholic, peculiar in that the tibialis anticus remained unaffected. This, indeed, was the only thing that threw doubt on the diagnosis, as the author had never known this immunity of the anterior tibial to occur in any but saturnine neuritis—with the exception of one case of indeterminate etiology.

Neuritis following Pneumonia.—Peripheral neuritis of any kind after pneumonia is rare, and a case of bilateral neuritis of the brachial plexus reported by Leszynsky[3] is altogether exceptional, if not entirely unique. The patient, aged 36, was attacked in the third week of pneumonia, the inflammation involving only the upper part of the plexus on either side, and this only to a limited extent. The right circumflex nerve was affected, but almost exclusively in its sensory distribution, and the left posterior thoracic (serratus magnus muscle). [It would seem to us, judging from the distribution, that the nerves became involved by direct extension of the inflammation or infection from the lungs, not from the general blood-state, as is usually the case.]

Multiple Neuritis in Pregnancy and Childbed.—Multiple neuritis in pregnancy is rare, severe if not dangerous, and nearly always accompanied by, if not due to, hyperemesis. Puerperal neuritis is less grave, and ordinarily

[1] Rev. de Méd., 1895, No. 5. [2] Jour. de Méd. de Paris, 1896, p. 138.
[3] N. Y. Med. Jour., Apr. 11, 1896.

due to infection. Vinay[1] reports a case that is, to a certain degree, a transition form between the two. During the first months of pregnancy the patient lost a great deal of blood, and during the last months suffered from hyperemesis, so that she came to confinement in a cachectic state. During the last 2 months of pregnancy she complained of paresthesia of the extremities and of pains and weakness in the legs. On the third day after delivery she had a chill, with fever that lasted only 48 hours, but on the fourth day she noticed that there was marked loss of power in all the extremities. This rapidly increased until she was almost completely paralyzed. About 6 weeks after confinement she began to improve, and 4 months from that date had fully recovered.

Alcoholic Neuritis and Tuberculosis.—Kelynack in 3 years examined postmortem 8 cases of alcoholic multiple neuritis, and found in 7 of them active tuberculosis. He thinks that a consideration of these cases seems to warrant the following conclusions: 1. The subjects of alcoholic paralysis are peculiarly liable to pulmonary tuberculosis. 2. A recognition of this fact is of considerable importance in arriving at an early and complete diagnosis and in forming a reliable prognosis. 3. It is desirable to treat cases of alcoholic paralysis in special hospitals, in country homes, or in healthy private houses, rather than in the almost unavoidably tubercle-contaminated wards of a general hospital. 4. The necessity for immediate removal of all alcohol from these cases and its replacement by nutritious diet. 5. The careful avoidance of causes leading to, and the necessity for early treatment of, all catarrhal conditions of the respiratory passages and congested states of the lungs.

Sharkey,[2] in opening a discussion on **multiple neuritis** before the British Medical Association, very properly called attention to the fact that many cases are wrongly called "neuritis," as the pathologic process is one of degeneration and involves none of the phenomena that belong to inflammation in other parts of the body. For such cases [and in our opinion they constitute the majority of cases grouped under "multiple neuritis"] he proposes the term "peripheral nerve-degeneration," restricting the term "neuritis" to the cases in which the ordinary vascular changes of inflammation are present. There is a third class of cases, generally rapidly fatal, as some cases of Landry's paralysis, in which no anatomic changes are found, and these he would designate "peripheral nerve-intoxication." This conception of the pathology of these cases was generally concurred in by those present. The only dissenting voice was that of Saundby, who was willing to concede that some cases might be purely degenerative, but thought that the ordinary processes of inflammation were generally present. Marinesco of Paris dwelt upon the pathogeny, which is nearly always that of an infection or intoxication. The fact that the terminal filaments are first affected was also considered. Sharkey thought it might be due to their more delicate structure, or because the finer filaments would be more accessible to the circulating poison than would be fibers gathered into a compact bundle, or because, perhaps, the nerve-endings are farthest removed from the trophic center of the fibers, the cells in the cord. Mott called atten-

[1] Lyon méd., Dec. 22, 1895.

[2] Brit. Med. Jour., Feb. 22, 1896.

tion to the theory advocated especially by Marie that the nerve-changes are not primary, but depend upon some change in the nerve-cells from which the fibers spring. In the present state of the technic for examination of nerve-cells he thought it impossible in many cases to prove or disprove either the central or peripheral origin of the changes. In some cases, however, they are certainly due to the direct action of the poison on the terminal filaments. Sharkey and Grainger Stewart both noted the peculiar and unexplained "affinity which certain poisons seem to have for certain nerves." [We consider this an unfortunate, because probably inaccurate, way of stating the clinical fact. It were better spoken of as a peculiar vulnerability of certain nerves to certain poisons.] Grainger Stewart spoke of the remarkably good results he had obtained in the treatment of these cases from the hypodermic injection of strychnin after the acute stage has passed. [See *Year-Book* for 1896.]

Neuritis with Spinal-cord Disease.—Petrini[1] describes a case that, so far as we know, is unique in presenting a multiple neuritis complicated by a severe spinal-cord lesion. The patient, a man of 37, a drinker and syphilitic, had a year previously recovered from an attack of multiple neuritis of the pseudotabes type. The final sickness began with pain, paresthesia, and weakness in the legs, gradually increasing in degree and spreading upward, until at the end of a month he was completely paralyzed, with muscular atrophy and reaction of degeneration. The muscles of respiration then became affected, tachycardia appeared, and the patient died about 6 weeks after the onset. The sphincters and pupils remained normal to the last. The microscopic examination showed degeneration and atrophy of all the nerves and muscles examined, and in addition a focus of softening in the cervicodorsal cord. The author does not make it plain whether this softening was hemorrhagic or thrombotic, but thinks it depended on diseased arteries due to syphilis. [Although a doubt remains in the reader's mind whether this focus may not have been a postmortem softening or artefact, it is an undoubted fact that alcohol or syphilis, or a combination of both, may cause at once multiple neuritis and degeneration of the arteries. We have, then, the possibility of an ascending paralysis, such as this was, caused by a combination of peripheral neuritis and acute cord-disease due to vitiated arteries.] Dejerine and Sottas[2] report a case of multiple neuritis with cell-changes in the cord. The patient presented all the symptoms of severe neuritis, gradually improved to a considerable extent, but never fully recovered. Seven years after the beginning of the trouble he died of tuberculosis, and the microscopic examination showed not only degeneration of the peripheral nerves and anterior roots, but also distinct changes in the cells of the anterior horns; which changes, they reason from the symptoms and histologic changes, were secondary to the neuritis, and not primary. Ballet and Dutil[3] have reported a similar case. The peripheral nerves were

[1] Jour. de Méd. de Paris, Sept. 8, 1895. [2] Abst. in Internat. Med. Mag., May, 1896.
[3] Progrès méd., May 16, 1896.

markedly degenerated, the anterior roots only slightly so, but there were distinct changes in the ganglion-cells of the anterior horns.

Neuritis from Bicycle-riding.—Dr. Destot[1] after a long ride on a wheel was attacked by a severe neuritis of the ulnar nerve, and he ascribed it to the pressure of the handle on the nerve at the root of the hand. If the handle be so constructed as to be grasped at a right angle with the full hand, the pad of flexor tendons and the fleshy part of the palm receive the pressure, and no injury can result; but if the handle must be grasped at an angle, pressure is exerted near the wrist, where the nerves are comparatively superficial, and considerable damage may be done.

Sensory Dissociation in Peripheral Disease.—Dissociation of sensation, for some time thought to be pathognomonic of syringomyelia (q. v.), has been found to be occasionally present in peripheral neuritis, tabes, hysteria, and other diseases. Barker[2] in an interesting study of "elective sensory paralysis" describes the reverse of the more usual sensory dissociation. In his own person pressure of a so-called cervical rib upon part of the brachial plexus caused anesthesia for touch, pressure, warmth and cold in the distribution of the cutaneus internus and antibrachius medialis, while sensation for pain was nearly or quite normal.

Nocturnal Incontinence.—Mendelssohn[3] in a long paper on this subject comes to the conclusion that the most generally successful treatment is a combination of three means—a supper without fluids, elevation of the foot of the bed [which is often of very signal service], and tincture of rhus aromatica, from 10 to 15 drops t. i. d., which, he says, seems to have a specific action in this trouble. It goes without saying that the general health of the child and any local affections of the genito-urinary system are to receive prompt attention. Prendergast[4] warmly advocates the cold douche or shower-bath at bedtime. He systematically used it on 80 "bed-wetters" (all boys) in an orphan asylum, and at the end of a few months all but 5 were considered as cured, and the 5 were all improved. He says, further: "During the whole course of treatment not a boy was placed on special diet; they ate whatever was served at meals, drank tea at supper, and had as much water as they wished. Not a drug of any kind was given, and not the slightest attention was paid to any peripheral causes, such as a long foreskin, tight prepuce, condition of the urine, etc., so that the test was a thorough one. One of the boys had been circumcised a year previous to the cold-water treatment without benefit, but was cured in 2 weeks by the douching. One very nervous lad was completely cured with 1 bath, probably owing to the shock and the profound mental impression. One of the cases cured was that of a feeble-minded boy of 11; he was mentally so deficient that it had been impossible to teach him the alphabet after 4 years' attendance at school, so that mental impression does not wholly account for the cure. The method employed in treating the cases was as follows: The boy was stripped and placed standing in an empty bath-tub; a basin, or a vessel

[1] Prov. méd., June 20, 1896.
[2] Jour. of Exper. Med., Apr., 1896.
[3] Berl. klin. Woch., Nov. 25 and Dec. 9, 1895.
[4] N. Y. Med. Jour., July 11, 1896.

with a spout to it like a watering-can, was filled with cold water and poured over the shoulders and down the back of the subject. In the nervous, delicate children one dash of water was sufficient for an application; in the sluggish, phlegmatic lads the dose might be repeated. The boy was immediately rubbed down, dressed in his night-clothes, and put to bed. From a hygienic point of view the cold water has proved an excellent tonic; not 1 of the 80 boys has had a 'cold' the past winter. A number of the boys treated suffered from incontinence of urine during the day, but all have been cured. Occasionally we have a backslider whose spinal center takes a 'nap,' but it is at once put on guard by a douche or two. The ages of the boys ranged from 6 to 12 years, and we have 485 in the institution. Since starting this article I have learned an important point in carrying out this treatment: it is, that sponging the back with cold water does not have the same effect as the douching. A private patient brought her boy to me for treatment for this condition. I ordered the cold douching, but the mother, from false motives of sympathy for the child, objected, and compromised by sponging the spine with cold water. She informed me 2 weeks afterward that cold sponging had had no effect, but that 6 cold douchings with a fountain syringe had cured the boy; this was a month ago, and the child has not relapsed yet. From this I would judge that the shock of the cold water is one of the important elements in the cure of the condition." [The author's theories as to the *modus operandi* of the treatment in the different kinds of cases are interesting, but not always convincing. The fact remains, however, that his results are extremely good, and the method certainly deserves an extensive trial.]

Raynaud's Disease in Children.—It is commonly supposed and generally taught that Raynaud's disease is rare under the age of 18, but Maugue,[1] having collected 171 cases of this disease, finds the ages as follows: 6 under 2 years, 5 in the third year, 35 between 4 and 18, 33 between 18 and 20, 46 between 30 and 43, and 46 between 43 and 77. He reports 3 original cases occurring during the first year of life, and 3 in infants 2 years old. The proportion, then, of cases to any one year is fully as high in the first years of life as it is later. In this connection we might mention a case recently reported by Batton[2] in a child of 3. The case seems to have been typical in every respect, the disease affecting the hands and feet, both ears, and the tip of the nose; there was no gangrene, and rapid improvement followed the administration of nitroglycerin.

Insomnia.—Rosenbach[3] proposes a novel device to protect nervous patients from noises of the house or street that prevent them from sleeping. A piece of cotton wadding about 6 by 3 cm. and 1 cm. or less in thickness is spread with a coating of vaseline and rolled into a tampon, the ends being slightly pinched in the rolling. This is then inserted into the auditory meatus to a depth of 2 or 2½ cm.; the protruding end is flattened out in the hollow of the ear and covered with a thin layer of cotton, which readily adheres to the

[1] Jour. de Méd. et de Chir. prat., Sept. 25, 1895. [2] Phila. Polyclinic, Mar. 30, 1895.
[3] Münch. med. Woch., Aug. 13, 1895.

vaselin. This plug will exclude all but the loudest noises. On removing it the meatus is lightly wiped out.

Homolateral or Collateral (Uncrossed) Hemiplegia.—Pineles[1] records a case of cerebral apoplexy with right-sided hemiplegia, in which the lesion found was a large meningeal hemorrhage of the right convexity. As microscopic examination showed good pyramidal decussation, the author attempts to explain the condition by supposing that the lesion, by pressure and indirectly by general edema of the brain, caused really a paralysis of all four extremities, but that the local irritation of the right motor cortex by the clot caused the muscular tonus and apparently voluntary movements observed on the left side. [The explanation seems to us scarcely adequate, as some of the movements (for example, an attempt to take a glass of water from the nurse) were too palpably the result of volition.]

Lederhose[2] reports a similar case due to traumatism in which trephining was done on the side opposite the hemiplegia, and the postmortem revealed a large subdural clot on the same side as the paralysis. He concludes that—1. In all kinds of brain-lesions with following hemiplegia this may be exceptionally collateral or uncrossed. 2. Dilatation of the pupils or unilateral choked disk on the hemiplegic side may lead to the diagnosis of a collateral brain-lesion or hemorrhage.

Arteriosclerosis of the Central Nervous System.—["Arteriosclerosis, the most frequent vascular disease of the central nervous system," certainly merits the careful, we would fain say the more careful, attention of practical physicians. It gives rise to a great multiplicity of symptoms of all degrees of severity, and these symptoms may be so grouped as to closely simulate other functional and organic disease of the nervous system.] Jacobsohn[3] divides the cases simply into mild and severe, although it is impossible to draw a sharp line of distinction, especially as the symptoms are not always proportionate to to the vessel-change. The graver symptoms are caused either by the plugging of a narrowed vessel with a thrombus or embolus or by hemorrhage from a dilated and fragile vessel. To these might be added symptoms due to the pressure of an aneurysm on the surrounding tissue. Thrombosis is the most frequent lesion, but is often combined with hemorrhage or aneurysm. So far as the nerve-tissue is concerned, the result is practically the same, be the lesion hemorrhage, thrombosis, or embolism. There is a destruction of the nerve-elements resulting in a cicatrix or a cyst. On microscopic examination Jacobsohn finds a great number of minute atrophic areas immediately surrounding the smaller and smallest arterial twigs, which have become narrowed in caliber or quite occluded. [This finding we consider important, as it would explain many of the more general psychic and somatic symptoms of arteriosclerosis—symptoms that frequently seem to point to a functional neurosis rather than to organic brain-disease.]

[1] Wien. klin. Runds., Feb. 23 and Mar. 1, 1896.

[2] Arch. f. klin. Chir., l. No. 2, abst. in Am. Med.-Sur. Bull., May 16, 1896.

[3] Arch. f. Psych. u. Nerv., Bd. xxviii. H. 3.

It is a peculiar and, as yet, unexplained fact that although no arteries of the brain or cord are exempt from arteriosclerosis, the process has a special predilection for the vessels of the basal ganglia, pons Varolii, and medulla oblongata. Why miliary aneurysms develop in the former location and other forms of arterial degeneration in the latter, why hemorrhage is more frequent in the vicinity of the internal capsule and thrombosis in the pons and medulla, is still an unsolved riddle. [Although it is probably true that the intravascular pressure is greater in these two sets of vessels than elsewhere in the brain, we are not ready to assume, with the author, that this would conduce to a plugging of the arteries as well as to their dilatation and rupture.]

A valuable part of the paper is that devoted to so-called **acute bulbar** (glossolabiolaryngeal) **paralysis,** which, the author proceeds to show, does not belong to the same category as the chronic affection of the same name, but is simply the result of arteriosclerosis, often syphilitic, of bulbar and pontine vessels. Clinically, it is atypical or irregular in the grouping of symptoms, because of the invasion by this same vascular change of neighboring or distant parts of the central nervous system. He proposes, therefore, to call the disease "multiple softening," and in support of the proposition reports a carefully studied case that was indeed atypical in symptom-complex and course, in which arteriosclerosis was the sole cause, and in which the exact microscopic examination showed widely disseminated lesions, various in degree, but all of the nature of softening. [There is no doubt that the author's thesis is entirely valid as regards his own and many other cases, but whether all cases heretofore known as acute bulbar paralysis fall within the same category must be determined by more extended experience. We think such will not be found to be the case.] In this category belongs a case very carefully studied and reported by Van Oordt:[1] A man of 73 was suddenly stricken with weakness of the left side and inability to swallow. The soft palate was paralyzed. He died 2½ months later, and the postmortem examination revealed a large unilateral focus of thrombotic softening in the medulla oblongata. The paper gives extensive references to the literature, as does also that of Wallenberg,[2] who reports a similar case, which, however, exhibited extensive and peculiar disturbances of sensation. There had been no autopsy in this case, and the diagnosis lay between thrombosis and embolism. Wallenberg thought the latter the more probable. Thérèse[3] gives an excellent resume of the subject of thrombosis of the vessels of the medulla oblongata, although reporting no original cases.

Hemiplegia in Typhoid Fever.—Osler[4] in reporting 2 cases of hemiplegia occurring in the course of typhoid fever gives the following classification of paralyses that occur during and after the specific fevers:

[1] Deutsch. Zeit. f. Nerv., 1896, Bd. viii. H. 3 and 4.
[2] Arch. f. Psych., Bd. xxvii. H. 2.
[3] L'Union méd., 1896.
[4] Jour. Nerv. and Ment. Dis., May, 1896.

Symptoms.	*Lesion.*
Hemiplegia. . .	Thrombosis of veins of meninges. Thrombosis and embolism of cerebral arteries. Hemorrhage. Meningoencephalitis.
Paraplegia. . .	Myelitis. Neuritis.
Diplegia. . . .	Neuritis.
Monoplegia. . .	Poliomyelitis. Neuritis.
Local paralyses.	Neuritis. (Toxic. Pressure.) Myositis.

The cases of neuritis greatly outnumber all other forms of paralysis in typhoid. The 2 cases of hemiplegia reported are the only instances that have come under the author's observation in a large experience with typhoid. The first patient was a girl of 7. The hemiplegia came on suddenly in the tenth week of typhoid, and the onset was attended with convulsions limited to the paralyzed right side, and unconsciousness. The face was involved, and there was aphasia for 7 weeks. The second case was that of a man aged 25. The hemiplegia suddenly appeared in the second week of the fever, unattended by convulsions. There was gradual improvement, but 8 months after the attack the hemiplegia was still marked—dragging of the foot, and the hand useless. Osler does not attempt a pathological diagnosis in his cases, but thinks the lesion in these cases is generally thrombosis. In this connection he also reports a fatal case of thrombosis of the cortical arteries in the course of typhoid. The patient, a man of 22, on the ninth day of the fever was suddenly attacked by a distressing feeling in the head, which was followed by a short, sharp clonic convulsion, with conjugate deviation of the eyes, rotation of the head, and unconsciousness. Further convulsions followed, and the patient died 8 hours after the onset. The autopsy showed thrombosis of the ascending parietal and parietotemporal branches of the middle cerebral artery.

Probably the only additional case in recent literature is that of Haynes, reported in the Bulletin of Johns Hopkins Hospital:[1] A man of 30 had a severe attack of typhoid fever, lasting 21 days, during the course of which the temperature rose as high as 105° F. On the 14th day of his illness it was noticed that he moved the left extremities less frequently and perfectly than the right. There were no spasms or convulsions of any kind. Improvement was very slow, but at the end of a year the leg had regained almost perfect function, although the arm was still greatly disabled. As the lesion was presumably cerebral, and as atrophy from cerebral lesion is rare, it is worthy of note that the muscles of the affected arm were markedly atrophic and showed diminished electric response.

[1] Jour. Amer. Med. Assoc., Dec. 12, 1896.

A New Type of Crossed Hemiplegia.—[There are 2 classical forms of crossed hemiplegia or crossed paralysis—that caused by a one-sided lesion in the lower part of the pons, in which the face is paralyzed on the side of the lesion and the extremities on the opposite side, and that due to a lesion of one crus cerebri, causing oculomotor paralysis on the same side and hemiplegia on the other.] Anna Goukovski[1] describes a third type, in which the tongue (hypoglossus) is paralyzed on one side and the extremities on the other. The illustrative case was a man of 60, who had an obliterating endarteritis, causing a focus of softening in one side of the medulla oblongata, just above the pyramidal crossing, which involved the motor fibres for the extremities of the opposite side and the root-fibers of the hypoglossal nerve for the same side. Raymond[2] also describes a peculiar case of crossed paralysis. The patient, a syphilitic woman of 39, presented paralysis of the extremities and lower part of the face on one side and of the external rectus of the eye (abducens nerve) on the other. On this side, too, the motor oculi communis was somewhat affected, as shown by slight dilatation of the pupil and its sluggish reaction to light and accommodation. The author makes a diagnosis of a basilar lesion which compressed the sixth nerve, involved to a slight extent the third, and affected the upper part of one side of the pons sufficiently to interfere with the pyramidal tract for the face and extremities.

Meningitis.—Well-authenticated cases of cerebrospinal meningitis in subjects as young as 6 days are rare. Roth[3] reports such a case. The course of the disease was sufficiently typical, but very rapid, lasting only 2 days. The child was at first restless, starting and crying out frequently, and had a temperature of 104.2° F. After the inception the temperature was lower, but there were frequent convulsions and transient attacks of cyanosis. Death immediately followed a severe convulsion. The autopsy showed the usual lesions of cerebrospinal meningitis, and bacteriologic examination discovered large micrococci in pairs or chains of 4 (pneumococcus). The mercury-treatment of cerebrospinal meningitis is not new, but Consalvi[4] reports unusually good results in 9 cases occurring in an epidemic of grip. Only 1 case, that of a girl aged 7, proved fatal, and in this case there was temporarily an improvement following the injections. The dose varied from $\frac{1}{13}$ to $\frac{1}{7}$ gr. of the bichlorid, according to the age of the patient, administered hypodermically once in 24 hours in the beginning and later once in 48 hours. The oldest patient treated was 19 years, the youngest 14 months. Most of the symptoms were relieved after the first 2 or 3 injections, though muscular rigidity persisted in some cases until after the seventh or eighth injection. In 1 patient an acute mercurial stomatitis developed after the tenth injection, and in another (both girls) a bloody diarrhea of short duration seemed to be the result of the remedy. Other therapeutic measures employed were leeches, ice, calomel in purgative doses, and bromid or morphin to quiet the patient when

[1] Nouv. Icon. de la Salp., 1895, p. 178; L'Union méd., Oct. 5, 1895.
[2] Rev. neurolog., 1895, No. 7.
[3] Arch. of Pediat., Aug., 1895.
[4] La Sem. méd., Jan. 15, 1896; Jour. of Nerv. and Ment. Dis., May, 1896.

necessary, with potassium iodid during convalescence. Smith[1] also reports very uniform success with the remedy. He begins with $\frac{1}{4}$ gr. of mercuric chlorid hypodermically, and then gives $\frac{1}{15}$ gr. every hour until there are symptoms of gastrointestinal irritation. He says that he has not lost a case in the last 10 years, during which time he has pursued this plan of treatment. He cites 7 cases. An early and constant sign of meningitis[2] is said to be a want of harmony in respiratory movement between the chest and abdomen. The chest-movements are almost restricted to the lower chest, and on inspiration the abdomen, instead of rising, as is normal, remains immovable or there is some retraction.

Exophthalmic Goiter.—[The latest and perhaps now the most generally supported theory (for as yet all is theory) regarding the pathology of exophthalmic goiter—Graves' disease, Basedow's disease—is that which considers the disease dependent upon abnormal action, probably over-action, of the thyroid gland. But this theory is far from being entirely satisfactory, and much more information is necessary before it can be unreservedly accepted.] This assertion is supported by the elaborate monograph of Brissaud.[3] He found, however, from the careful microscopic examination of the thyroids from 2 cases of Graves' disease and of 25 thyroids from miscellaneous cases, as well as from a consideration of the literature, that although the glands in exophthalmic goiter showed no changes peculiar to that disease, yet quantitatively the changes were always such as to make "hyperthyroidation" possible. [The results of treatment have not thrown much light upon the nature of the disease. Most cases have been aggravated, or at least not benefited, by thyroid extract, but a few have been improved. The same may be said of the preparations of thymus gland.[4]] Even the results of extirpation or partial extirpation of the gland are rather contradictory, although many cases have been unquestionably benefited by the operation. Starr,[5] an active advocate of the thyroid theory, has made a recent collection of operated cases which makes a very good showing for the operation. [But we are inclined to think that a close scrutiny of the cases would somewhat modify the number of "entirely cured."]

Generally, the first symptom relieved by the operation is the tachycardia; the nervousness, sweating, paresthesia, etc. improve later, and the exophthalmos is the last to yield. Improvement after operation, therefore, may be expected to be gradual and progressive. Regarding medicinal treatment Starr says: "I desire to mention one remedy which in several cases has seemed to me to be of great service—namely, the glycerophosphate of sodium, in 20-gr. doses, 3 or 4 times a day. This was first used by Trachewsky in Kocher's clinic, and was found to have the effect of diminishing the size of enlarged thyroid glands. It has also been successful in the hands of Chibret. Under

[1] Jour. Am. Med. Assoc., June. 13, 1896. [2] Alienist and Neurologist, July, 1895.
[3] Corps thyroide et Maladie de Basedow, Bordeaux, 1895.
[4] Williams, Clin. Jour., Dec. 11, 1895; Edes, Lancet, Feb. 29, 1896.
[5] Med. News, Apr. 18, 1896.

treatment by this drug alone a patient in the Presbyterian Hospital was markedly benefited within 3 weeks. A second patient, to whom various forms of treatment were given by me for 1½ years, appreciated within 2 weeks the fact that this remedy had been of more decided benefit in every direction than any other which had been used in the previous period."

The present confusion of the subject is well illustrated by the discussion of Dr. Starr's paper.[1] In this 13 physicians took part, and scarcely 2 were of the same opinion regarding either the pathology or treatment.

Steinlechner[2] records a case of Graves' disease complicated with tetany [which is confusing if we admit the thyroid theory of the former disease, as the latter is often caused by removal of this gland].

Hösslin[3] in an extensive paper on exophthalmic goiter lays particular stress upon two therapeutic measures. For the distressing attacks of tachycardia to which many of these patients are subject he has found nothing equal to clysters of some emulcent containing 20 to 30 drops of tincture of opium. [The drug is ordinarily not well borne when given by the mouth.] The other important point in the treatment is to put the patients on an exclusively vegetable diet.

Tetany.—Marschner[4] reports 5 cases in adults from the clinic of von Jaksch, all of which were seen within 5 months. The first case is noteworthy from the presence of choked disks. "The disk on either side was indistinctly defined, somewhat reddened, and there was venous congestion of the retina; these changes were less pronounced on the left side than on the right." With improvement in the tetany the papillitis gradually grew less marked, but had not entirely disappeared when the patient was discharged. The second patient had a moderate goiter, and was put on thyroid extract for 2 weeks, which seemed to reduce the size of the gland somewhat, but had no influence on the symptoms of tetany. In the third case the thyroid gland seemed to be normal, but the patient was given thyroid tablets for a period of 2 weeks. They apparently had no effect either upon the course of the disease or the size of the thyroid. The fourth patient was treated with Leichtenstern's tablets of thyreoidin during the time of observation, three weeks. They caused some decrease in the size of the previously slightly enlarged thyroid gland, but are said to have had no effect upon the tetany. [As the patient improved, and when discharged was free from attacks and Trousseau's symptom was no longer obtainable, it would seem to us difficult to substantiate this latter assertion.] The fifth patient was suffering from carcinoma of the stomach with metastatic growths in the omentum, and had her first and only spasm of tetany following the removal of 7½ liters of fluid from the peritoneal cavity. In all of these cases except the fifth the faradic reaction of nerves and muscles was found to be exaggerated, contrary to the experience of most observers, who have found this exaltation of electric excitability limited to the galvanic current.

Thomson[5] treated a rachitic baby 15 months old suffering from tetany by

[1] Jour. of Nerv. and Ment. Dis., June, 1896. [2] Wien. klin. Woch., 1896, No. 1.
[3] Münch. med. Woch., No. 2, 1896. [4] Deutsch. Arch. f. klin. Med., Mar. 26, 1896.
[5] Arch. of Pediat., 1896, xiii. No. 3.

the administration of thyroid extract. The result was negative, and antirachitic treatment was substituted. The results of this were also unsatisfactory, although in most cases such treatment is successful. The author thinks thyroid should be used with extra care in patients having a tendency to laryngismus. Bonome and Cervesato[1] report 2 cases in infants of 1 and 2 years respectively. One child had gastroenteritis and rachitis, but the other showed no cause for the affection. [The authors consider their findings in the spinal cord very important, but from the reading of the report we would judge them to be of purely artificial origin, probably caused by careless handling of the cord in removing it or subsequently.] Godart-Danhieux[2] reports a case of tetany in an adult which was of undoubted gastric origin. The patient had been suffering from enormous dilatation of the stomach, with all its attending evils, for some time, and improved and relapsed a number of times. He was finally, when in a state of exhaustion and emaciation, attacked with very severe and refractory tetany, which proved fatal. The author remarks that scarcely 30 cases of gastric tetany have been published. [This would certainly exclude the infantile cases, and, we think, would not cover those in adults.]

Levy-Dorn[3] reports a typical and fully-developed case treated with tablets of thyreoidin. The patient was a woman of 23. After 3 days of treatment there was distinct improvement, and the spasms ceased after the sixth day, but returned at the time of menstruation, 14 days later. From that time there had been no recurrence up to the time of report, 4½ months. Only 17 tablets were given in all. Krauss[4] reports 5 cases of infantile tetany, all of which occurred in the practice of a physician in Buffalo within a period of 3 months—a most exceptional record for this country. The children were from 6 to 18 months old, and in every case the child was suffering from gastrointestinal trouble or bronchitis, or both. The disease lasted from 6 days to 3 weeks. One patient died 4 weeks later of acute meningitis. Sarbo[5] reports 3 cases, 2 of which were of particular interest, principally because the patients were a mother and her 3-year-old daughter. The third patient was a shoemaker, 17 years old, whose symptoms were sufficiently characteristic, although Trousseau's sign could not be elicited. It is particularly noted that in the triceps there was myotonic electric reaction; that is, a persistence of the contraction after cessation of the electric stimulus. This symptom is almost confined to Thomson's disease, and the author found no record of its occurrence in tetany. From an extensive review of the symptomatology and known causes of tetany Sarbo concludes that the cases all have only one thing in common, and that is a condition of impaired nutrition. The action of all toxic agents and infectious processes is alike in that it impairs the structure, and hence function, of nerve-cells and fibers, but more especially of the former. He then proceeds to show that tetany must be a central disease, an affection of the cells of the central nervous system, with possibly secondary involvement of the peripheral nerves.

[1] La Pediat., 1895, Nos. 5 and 6.
[2] La Policlin., Oct. 1, 1895.
[3] Therap. Monatsh., Feb., 1896.
[4] Med. Rec., Jan. 11, 1896.
[5] Deutsch. Zeit. f. Nerv., 1896, Bd. viii. H. 3 and 4.

Tetanus.—[We gave last year a rather extended report of cases of tetanus treated by the injection of tetanus-antitoxin, which, on the whole, gave a rather favorable impression of this method.] Kneass[1] in an excellent resume of the subject draws conclusions less favorable. He has collected from the literature 68 cases thus treated, of which 61 are available for statistical purposes, and these give a mortality only slightly less than that prevailing under older methods. [It is known that the shorter the period of incubation the greater the mortality. Cases developed within a week rarely recover, and when the period of incubation is more than 2 weeks they rarely die.] The author says: "When we remember the experimental proof that the sooner after inoculation the antitoxic serum is injected the more likelihood there is of some beneficial result, we should expect, if there be any such effect, to find it among those cases in which the treatment was earliest begun. A glance at the table will show that this is not the case. Of the 16 fatal cases whose period of incubation ranged from 6 to 14 days, 14 had the treatment begun during the first 4 days, and of the 25 in which the serum was injected before the fifth day, 14 were fatal. Among the 68 cases but 22 are reported as causing an immediate improvement in the character of the symptoms, and in many of these the injections were begun so late in the course of the disease that one hesitates to ascribe this improvement to anything but a coincidence. This agrees with many of the authorities. Burger says that 'without rejecting the injections of antitoxic serum in the treatment of tetanus, we can have but the most limited confidence in its curative efficacy.' Roux has said that he has never seen the serum have the least effect upon the course of the disease."

Tirard[2] records a case of recovery. A girl of 4, daughter of a butcher and accustomed to run about the stables in her bare feet, began to be ill about 2 weeks after receiving a cut on the foot. After 3 days of general malaise severe convulsions began, and continued in spite of large doses of chloral. Antitoxin was first given more than 3 days after the first convulsion and when the child was in bad condition, there being general rigidity, trismus, risus sardonicus, frequent general convulsions, and more frequent "starts." Six injections of 10 gr. each were given in 3 days before there was material improvement, although some amelioration was noted after the third dose. After this the progress toward recovery was continuous, but slow, it being a month before it was complete. Marson[3] reports the case of a man aged 28 who suffered a compound fracture of the thumb, and 10 days later developed a rigidity of the masseters. He was treated for 6 days with physostigmin, chloral, and bromid, the stiffness increasing slightly in extent and severity. On the sixth day he had a mild convulsion, and was given an injection of 34 gr. of antitoxin, which was repeated in 8 hours. There was some immediate improvement, and the remedy was given during the next 4 days in diminishing doses. Although the convulsions ceased, the temperature steadily rose during the administration of the antitoxin, and continued after it was withdrawn,

[1] Jour. Am. Med. Assoc., July 18, 1896.
[2] Lancet, Nov. 2, 1895.
[3] Ibid., Aug. 10, 1895.

reaching 104.2° F., and the patient died, apparently of heart-failure, in an unconscious state following delirium. No autopsy. The author collected 38 cases of tetanus treated with antitoxin, with 25 recoveries. Of 22 in which particulars were given, 17 recovered, and of these 9 were designated as "severe," with 5 recoveries, and 13 as "mild," with 12 recoveries. [It will be seen that these statistics give a much more favorable view than those of Kneass.] Hartley[1] reports the case of a man of 44 injured while shoeing a horse. The first symptoms of tetanus appeared 13 days later, and after $2\frac{1}{2}$ days, chloral having no effect, he was given 1 g. of antitoxin. This dose was repeated daily or twice daily for several days, and chloral was given at the same time. The antitoxin controlled the convulsions and local spasm much better than did the chloral, but was more depressing, and the latter drug induced sleep fully as well as or better than the former. The best result seemed to be attained by the administration of both—the antitoxin to calm the muscular spasm and the chloral as a hypnotic. Marked improvement did not occur before the twelfth day of the disease; he was sent home 3 weeks after the onset, and the injured arm was somewhat rigid for 5 weeks more. In this case, as in many others, the antitoxin produced an urticarial rash. The injections were painful and caused local swelling and inflammation.

"In summing up Cowling's report on tetanus, Yandell says: 'Recoveries from traumatic tetanus have been usually in cases in which the disease occurs subsequent to 9 days after the injury. When the symptoms last 14 days recovery is the rule, apparently independent of treatment. The true test of a remedy is its influence on the history of the disease. Does it cure cases in which the disease has set in previous to the ninth day? Does it fail in cases whose duration exceeds 14 days? No agent tried by these tests has yet established its claim as a true remedy for tetanus.' In how many cases has tetanus antitoxin been tried when the symptoms have come on at an early date after the injury, and what have been the results?"

Timmermann[2] reports a case of recovery in which the period of incubation was 17 days. Physostigmin, morphin, and chloral seemed to control the spasm at first, but after a few days respiration was so impeded as to render death apparently imminent, and antitoxin was given. Improvement was not immediate, but gradual, more than a week elapsing before the spasms ceased. Withington[3] reports a case following abortion. It recovered under antitoxin and other remedies, but was atypical in many respects, and the diagnosis cannot be unquestioned. Smith[4] alludes to 4 cases of tetanus neonatorum treated with antitoxin, of which 1 recovered. Walko[5] reports a case coming on 9 days after confinement. Injections were begun on the fourth day of the disease, 0.2 g. being given every 5 hours. The patient died on the eighth day. Grayson[6] reports a case of moderate severity in a child of 6 who was wounded in the foot by a nail. The period of incubation was 7 or 8 days and

[1] Lancet, Dec. 7, 1895.
[2] Med. Times; Milwaukee Med. Jour., Jan., 1896.
[3] Boston M. and S. Jour., Jan. 16, 1896.
[4] Arch. of Ped., Dec., 1895.
[5] Deutsch. med. Woch., 1895, No. 36.
[6] Pittsburg Med. Rev., Oct., 1895.

the onset gradual. After 12 days antitoxin was given, as the patient had grown worse on bromid and chloral, with almost immediate improvement. One dose a day, 5 to 10 c.c., for 4 or 5 days was administered, and convalescence was uninterrupted except by a papular eruption. Trevelyan [1] reports a very severe case of cephalic (head) tetanus treated by antitoxin and ending fatally. The period of incubation was 12 days; treatment was begun 1½ days after the onset, and the patient died on the sixth day, the antitoxin apparently having had no effect. Tracey's case [2] also apparently began as head-tetanus, but rapidly became general. The period of incubation was supposed to be 12 days. The first 2 days there was no treatment; then for 5 days it was restricted to bromid and morphin, at the end of which time antitoxin was begun, as the patient had grown worse and convulsions occurred every few hours. After the first dose the spasms were distinctly more frequent and severe, and after the second, 12 hours later, they were still more frequent and were accompanied by delirium. After this there was gradual improvement, antitoxin and morphin both being employed, the former seeming to have more effect than the latter. [Antitoxin was given in this case for more than 2 weeks, and, altogether, the author thinks it was of decided utility. The account of the case as given by him is not very convincing on this point.] The cases of Macartney [3] are somewhat unusual, and in the absence of urinary examination the diagnosis might be questioned. A woman of 50, 8 days after the removal of an epithelial growth, experienced some stiffness about the jaws. This very gradually grew worse, and a week later she began to have spasms with opisthotonos. They were not very severe, but came on (after about 12 hours) every 10 to 15 minutes. The minimum dose of antitoxin was then injected, but it had no effect on the spasms, and the patient suddenly died 1 hour later. The second case was that of a boy of 5½ years who developed the first symptoms 7 days after a crush of the foot. The onset was sudden and violent, epileptiform in character, and similar fits occurred several times in the next 12 hours. The existing slough was then freely cut away and one-fifth the adult dose of antitoxin injected. The convulsions continued unabated, and about 4 hours after the first a second dose was administered. This seemed to have no effect whatever, and the patient expired 4 hours later. The author alludes to a third case in the practice of a colleague. The period of incubation was 3 or 4 days, and antitoxin was given early, a second dose being given 6 hours after the first. The remedy apparently had no effect, and the patient died a few hours after the second dose. Thursfield [4] reports 2 cases: The first was a man of 50, injured in an epileptic fit, period of incubation 10 days; first treatment (bromid and chloral) 8 days after the onset, antitoxin the next day. The chloral with morphin was continued, and 1 g. of antitoxin injected from twice a day to once in 2 days. Improvement was gradual, and antitoxin was discontinued after the eighth day. He had occasional spasms for 6 days after this, and it was almost a month before he was well. The second patient was a gardener of 18

[1] Brit. Med. Jour., Feb. 8, 1896.
[2] Lancet, Feb. 1, 1896.
[3] Ibid., Jan. 18, 1896.
[4] Birmingh. Med. Rev., Feb., 1896.

years, period of incubation about 17 days, onset gradual, progress slow; antitoxin first given on the seventh day, when there were well-marked spasms with opisthotonos. In 2 days 3 injections of 1 g. each were given, but the patient grew steadily worse, and died 6 hours after the last dose. [In reading the account of these cases we receive the impression that the antitoxin neither hastened recovery in the first nor retarded death in the second.]

Swindells[1] reports 2 cases of recovery, the only drug given being chloral hydrate in repeated doses. One was a case of chronic tetanus, and the other a mild case of the idiopathic form. Proegler[2] also reports a mild case that ended in recovery. The patient was 2 years old, the period of incubation 2 weeks, and the treatment 5-gr. doses of chloralamid every 3 to 4 hours, given by the rectum. Lawrenson[3] reports a fatal case in which the entrance of infection seems to have been through a chilblain. The patient had been sick for 5 days when first seen, and died the next day. Treatment was chloral, 10 gr. every 4 hours.

Grinnell[4] reports a successful case treated with veratrum viride and gelsemium. The patient, a boy of 6, cut his foot on a piece of glass, and showed the first symptoms of tetanus 9 days later. Two days after that he began to have convulsions. The cicatrix was scraped, the site scarified and disinfected, and bromid given. As there was no improvement after 4 hours, Norwood's tincture was administered, at first 1 drop, later 2 drops, every hour. As this did not prevent the repetition of the spasms, fluid extract of gelsemium was added in like doses. On the third day of this treatment the dose was increased to 3 drops of each every hour, which seemed to control the spasms. These doses were continued for 48 hours, and only once caused vomiting. When complete relaxation had been obtained the amount of the drugs given was gradually diminished for 8 days, when treatment was discontinued. Ammonium bromid was given throughout the period of active treatment in doses of from 3 to 4 gr. every 2 hours.

The New York City Health Department now furnishes the antitoxic serum.

Acromegaly.—[On this subject there is but little to add to the matter contained in the *Year-Book* for 1896. Cases continue to be reported with a frequency that is astonishing, considering that the disease was not recognized until recently.] Dallemange[5] reports 3 cases with autopsy. In all there were changes in the pituitary body, and in 2 of them in the thyroid gland also. [Although changes in the pituitary body are so frequent in acromegaly, the relation of such changes to the disease is still a matter of doubt. Some writers, as Marie, who first described the affection, think that disease of this body causes acromegaly, as disappearance of the thyroid causes myxedema, while others, among them Dallemange, think the changes in the pituitary body are secondary to the general nutritive disturbance of the disease.] This latter opinion is shared by Sanger Brown,[6] who reports a typical case, with

[1] Lancet, Feb. 1, 1896.
[2] Med. Rec., Oct. 5, 1895.
[3] Brit. Med. Jour., Dec. 25, 1895.
[4] Med. News, July 18, 1896.
[5] Arch. de Méd. et d'Anat. path., Sept., 1895.
[6] N. Am. Pract., Sept., 1895.

symptoms strongly indicative of enlargement of the pituitary body. Worcester[1] reports a case interesting in the combination of myxedema and acromegaly: A woman of 70 was admitted to the asylum apparently suffering with senile dementia. There was well-marked myxedema, and considerable improvement followed the administration of 5 gr. of desiccated thyroid 3 times a day. After this there was no treatment and no record for a year, when she was found to have the appearance of acromegaly. She gradually grew weaker, and died 6 months later. The autopsy revealed a much enlarged pituitary body, the weight being 58 g. and the longest diameter 4.6 cm. No normal structure was found. The condition of the thyroid was not stated. The results of pituitary feeding throw no light upon the nature of the affection, as they are not at all uniform [as, indeed, we stated last year]. Rolleston[2] reports a sufficiently typical case in a woman of 34, who lost the sight of the



FIG. 133.—Hand of a patient with acromegaly alongside that of a robust woman of the same stature. The broad, spade-like hand of acromegaly is well shown (N. Y. Med. Jour., Jan. 11, 1896).

left eye in less than a year after the onset, and when examined had nasal hemiopia of the other. There were no signs of choked disk, but optic atrophy was present. This pointed strongly to enlargement of the pituitary body, but 5-gr. doses of pituitary extract t. i. d. for a month were of no avail whatever. Ransom has reported negative results of this treatment, while a case under the care of Broadbent[3] seemed to improve. Marinesco[4] has reported

[1] Boston M. and S. Jour. Apr. 23, 1896.
[2] Lancet, Apr. 25, 1896.
[3] Ibid., Mar. 28, 1896.
[4] Mercredi méd., 1895, No. 46.

3 cases, all of them having symptoms indicating pituitary enlargement. The general condition seemed to improve, as did headache and other pains, but the treatment has no effect upon the enlargement. Thayer[1] reports a case of acromegaly and 3 of **pulmonary hypertrophic osteoarthropathy,** with the differential diagnosis and illustrative photographs (see Figs. 133, 134). In the



FIG. 134.—Hand in a case of hypertrophic pulmonary osteoarthropathy beside that of a robust individual of the same stature (N. Y. Med. Jour., Jan. 11, 1896).

latter affection the general nervous disturbances of acromegaly, the eye-symptoms referable to enlargement of the hypophysis, and the overgrowth of the tongue, nose, and chin are absent, although the enlargement of fingers, wrists, and feet may be exceedingly similar. As the patient with acromegaly had a large goiter, she was treated with thyroid extract, but with negative result. Bruns[2] has, among others, reported a case in which thyroid treatment was more effective. A woman of 24 presented nearly all of the signs typical of acromegaly. She was very nervous, excitable, anxious, seldom free from headache, suffered from numerous paresthesiæ and pains in the upper extremities, and all the symptoms were greatly aggravated by exertion. Thyroid extract caused an immediate improvement in all these distressing symptoms, so that she could resume her ordinary pursuits. There was general loss of flesh, but

[1] N. Y. Med. Jour., Jan. 11, 1896.

[2] Neurolog. Centralbl., Dec. 15, 1895.

no impression was made on the peculiar enlargements of the disease. After 2 months of active treatment the patient became emaciated, very weak and "chlorotic," and the pulse rose to 120 in the recumbent posture. The glandular treatment was then stopped, quiet enjoined, and iron given, but before the patient had greatly improved in general condition the pains, headache, and paresthesia returned. [The case again shows that thyroid extract is no harmless agent, that it must be used with care, and that its good effects are apt to persist only during its administration.]

Sears[1] reports a very similar case in a woman 45 years of age and of neurotic heredity. She suffered greatly from various paresthesiæ, stiffness of the joints, palpitation, sweating, and mental sluggishness. The physical condition was typical of acromegaly, but there were no eye-symptoms indicating a tumor of the pituitary body. A few symptoms pointed also to myxedema. She was put on general tonics and the dried extract of thyroid gland in gradually increasing doses up to 12 gr. a day. "Three months after her first visit she reported that she was feeling very much better and took more interest in current events. Her memory had improved and she spoke and moved more rapidly. Pain in the hands had greatly diminished, so that she slept well at night, but her joints still felt stiff. Her grasp was firm, and she was able to do her own washing and ironing, even to wringing out the clothes with her hands. The 'puffing' in her ears was gone and the palpitation of the heart better. There was much less puffiness about the eyes and no pitting over the ankles. She had lost over 20 lb. in weight, but felt stronger than for many months. From this time to the present her general condition has remained practically the same or possibly has slightly improved. She has been able to do all her own housework, even to the sewing, and has also gone out on 1 or 2 occasions in the capacity of monthly nurse. Her mental condition is normal, except that she complains that her memory is still somewhat defective. Her weight is still further reduced, so that she now tips the scales at 146 lb., but there has been no change in the measurements of her hands or feet. The longitudinal furrows on her nails are, however, less marked, and her tongue shows a considerable diminution in size. The mucous growths in the nose have disappeared and the nasal passages are unobstructed. During last June she suffered for a time from very severe vertical headaches, and she has had occasional attacks of palpitation and vomiting, which were apparently due to an overdose of thyroid extract, which she has taken almost continuously in daily amounts varying from 3 to 9 gr. The temperature, which was taken only at infrequent intervals, ranged from 98.5° to 99.2°, more commonly the latter."

Last year we presented the thesis of Brissaud and Meige that acromegaly is most intimately related to gigantism. To this Marie emphatically objected, but Brissaud in a second communication[2] advances strong arguments to show that when the abnormal growth begins before the union of the epiphyses the result is gigantism, and when it begins after the period of natural growth the the result is acromegaly. He cites a number of illustrative instances. Among

[1] Boston M. and S. Jour., July 2, 1896. [2] Société méd. des Hôp., May 15, 1896.

these would belong the case of a young giantess reported by Hutchinson,[1] who not only showed some of the signs of acromegaly, but also possessed a greatly enlarged pituitary body, as was shown by autopsy.

Figures 135, 136 represent a case of acromegaly observed by Dr. H. H. Vinke of St. Charles, Mo. The illustrations are of particular value in showing the remarkable changes that have occurred between the ages of 28 and 51 years, and as illustrating the extreme deformities of the disease.



FIG. 135.—Case of acromegaly at 28 years of age.



FIG. 136.—Case of acromegaly at 51 years of age.

(From photographs furnished by Dr. H. H. Vinke, St. Charles, Mo.)

Asthenic Bulbar Paralysis.—[Time and again cases of bulbar paralysis have been reported with negative postmortem findings, also clinical cases closely simulating bulbar paralysis, but apparently not due to organic disease. In the *Year-Book* for 1896 we reported on what Jolly called myasthenia gravis pseudo-paralytica in which bulbar symptoms are pronounced.] Strümpell[2] now adds a typical well-observed case with autopsy, and proposes the above name. The paralysis involved especially the tongue, lips, and pharynx, but the eyes and extremities were to a certain degree affected. There was no atrophy, nor any change in electric reactions, even in almost completely paralyzed parts, which would distinguish it at once from a true bulbar paralysis. Moreover, the reflexes were normal or only slightly exaggerated; but the most striking characteristic was the rapid exhaustion, not only of most of the paretic parts, but also of muscles apparently normal. This striking trait was emphasized by Jolly [see *Year-Book* for 1896, p. 622], but, contrary to Jolly's finding, Strümpell could not demonstrate a like exhaustion after electric stimulus, nor was one group of muscles affected by exertion of another. The patient, a woman of 21, gradually grew weaker, the paralysis more general and complete, choking and dyspneic attacks were added, and she died 13 months

[1] Am. Jour. Med. Sci., Aug., 1895. [2] Deutsch. Zeit. f. Nerv., Bd. viii. H. 1 and 2.

after the beginning of the disease. The careful microscopic examination was entirely negative. [The disease is purely motor, but whether of the central or peripheral nervous system, or of the muscles only, remains for the present undetermined].

Murri[1] reported recently a similar case which had already run a vacillating course of 12 years. His report is interesting in that he found that muscles completely exhausted by the faradic current retained undiminished response to voluntary impulse. He considers the disease to be neuropathic and not myopathic.

Four sufficiently typical cases are reported by Pineles,[2] 2 of which improved and 2 terminated in rapid death from asphyxia. They all presented paresis of muscles supplied by bulbar nerves and the rapid fatigue that is so characteristic. Pineles particularly notes the frequent remissions that may mislead the physician to a diagnosis of hysteria. Bruns[3] in commenting on these cases speaks particularly of the danger of sudden death, and alludes to a case seen by himself in which fatal asphyxia immediately followed the use of an esophageal tube. He cautions also against the use of strong electric currents. The first case of this kind [so far as we know] reported in this country is described by Collins,[4] who with Strümpell prefers to call it asthenic bulbar paralysis. The patient was a woman of 27, whose symptoms had begun 3 years before with sudden ptosis of the left eye and double vision, which trouble passed off in a few months. A couple of years later she experienced for about 8 weeks a similar condition of the right eye. When she came under observation there was a general weakness of the entire body, which was fatigued with extreme ease, but it was particularly the parts concerned in speech, mastication, and deglutition that tired rapidly. A careful examination for organic disease was entirely negative. Under a plan of rest-treatment she rapidly improved, and in 4 months was almost well, when an acute follicular tonsillitis caused a relapse. Under proper treatment she again improved for a few months, when a third and bad relapse suddenly occurred without apparent cause. She had partially recovered from this at the time of the last attack. Without going into details, it is sufficient to say that at no time was there complete paralysis of any muscles, neither was there atrophy, fibrillary twitching, nor any change in electric reaction or in the reflexes, as below noted. The essential features of the case were lack of vigor, with rapid fatigue affecting the entire muscular system, but more especially the tongue, lips, and pharynx. This rapid fatigue also characterized the reflexes and electric response. They were not strong, but otherwise normal, but after being elicited a few times rapidly diminished, and then disappeared until after a period of repose. The special senses, especially sight and hearing, also showed the same lack of endurance. The treatment is rest and the prognosis grave, although cases have been known to recover.

Since the foregoing was written 2 additional cases have been contributed to

[1] Policlinico, vol. ii., M. fasc. 9, Rome, 1895.

[2] Wien. Jahrb. f. Psych., Bd. xiii. H. 2 and 3.

[3] Schmidt's Jahrb., 1896, No. 1.

[4] Internat. Med. Mag., Apr., 1896.

the literature by Kojewnikoff.[1] At least he describes them under the above title, although it is far from certain that the second one belongs in this rubric. As between various nosological groups individual cases are found that seem to be transition forms, so this patient of Kojewnikoff seemingly presents the characteristics of an incomplete case of progressive glossolabiolaryngeal paralysis with the principal symptoms of asthenic bulbar paralysis added. That is, it apparently unites the pathology of the two classes of cases, and the conclusion might be drawn that the process in asthenic bulbar paralysis differs from that of chronic bulbar paralysis only in being less in degree and less definitely located.

Disturbance of Speech from Anemia.—In connection with the foregoing should be noticed the cases recently described by Hallervorden[2] [although this author himself seems to have overlooked their clinical resemblance]. He observed 3 well-marked and strikingly similar cases of a peculiar speech-anomaly caused by the acute anemia of severe hemorrhage. The trouble consisted in a combination of alalia and aphasia; that is, the patient in the first place could not articulate distinctly, speaking with the thick, dragging utterance of a drunken man or of bulbar paralysis, and secondly there was difficulty in finding the proper word and in clearly grasping the spoken language of others. The similarity to asthenic bulbar paralysis is great. There is general prostration, most noticeable in the parts supplied by bulbar nerves, and furthermore, to which the author calls particular attention, there is a very rapid fatigue. When beginning to speak the patients could do so tolerably distinctly and correctly, but almost immediately the mechanism seemed to become exhausted and the effort had to cease. This was more noticeable as the patients approached recovery. A strong effort of the will would for a few minutes mend the trouble, and a stimulant (brandy) acted in the same way, but the improvement was but temporary. [But here we have, in addition to "bulbar" exhaustion, interference with the cerebral center of speech, showing that there is, in all probability, an affection of the brain, medulla, and muscles—a condition of affairs that may throw some light upon the pathology of the other and more chronic functional affection.]

Convulsions from Lead and Alcohol.—It is not a late discovery that convulsions may be due to lead or alcohol, but, as the fact seems not to be very generally known, we deem it well to mention 3 cases reported by Jackson.[3] They particularly well illustrate that lead-poisoning or alcoholism complicated with nephritis makes a particularly dangerous combination. Jackson's first case, a painter aged 21, whose father had died of lead-poisoning, had wrist-drop and the characteristic lead line. After ailing a few days he had convulsions rapidly following each other, after which he was for some time in a stuporous condition, which persisted in a minor degree for several days. There was a trace of albumin in the urine, which disappeared on recovery.

[1] Deut. Zeit. f. Nerv., Nov., 1896. [2] Arch. f. Psych., Bd. xxviii. H. 2.
[3] Boston M. and S. Jour., Apr. 2, 1896.

He had no return of albumin nor of convulsions, and the author very reasonably attributes the convulsions to the lead. [But he seems not to notice what should not be forgotten, that, although the convulsions may have been due to lead, their occurrence may have been, and likely was, favored by the slight nephritis. It should be remembered, too, as was noted in the *Year-Book* for 1896, that there is such a thing as toxicopathic heredity, and the death of the father from lead is, in this relation, a most pregnant fact.]

In the second case there was a complication of alcoholism, amyloid kidney, purulent peritonitis, and syphilis, the latter two being unrecognized until the time of the autopsy. [Of this quartet it is difficult to say which integer played the most prominent part, but we agree with the author that it was the alcohol.]

Case 3 was a man of 29, a steady worker and a steady and hard drinker. He had had some dizziness on several occasions. One day this became worse, and was followed by 2 severe convulsions, and these by violent delirium. The urine contained a trace of albumin. Delirium with occasional convulsions continued until death 2 days later. [There was no microscopic change in the kidneys, but we would hesitate to say with the author that the case proves "beyond any reasonable doubt that fatal epileptiform convulsions may occur in alcoholic poisoning independent of renal disease," although the alcohol was beyond peradventure the most active etiologic factor.]

The Spinal Cord in Pernicious Anemia.—[In the *Year-Book* for 1896 some attention was given to the changes produced in the spinal cord by various abnormal blood-states, particularly pernicious anemia. The contributions of the year have served only to strengthen the conclusions there given, notably an additional contribution by Nonne[1] and one by Lloyd.[2]] The patient of the latter presented during life no symptoms that might not have been accounted for by the pernicious anemia (hemoglobin, 23%; red cells, 1,280,000). Postmortem, there was found marked degeneration of both posterior columns, and changes less pronounced in the pyramidal tracts. The direct cerebellar tracts, contrary to the rule, were found intact. Some notice must be taken of a paper on this subject by Teichmüller[3] with report of a case from the clinic of Prof. F. A. Hoffman in Leipsic. [An attempt is made, on the strength of the microscopic examination, to disprove the generally accepted statement of Nonne, that in pernicious anemia the white substance alone is affected, the nerve-roots and gray matter remaining intact. But the paper contains internal evidence that the conclusions of its author are entirely without foundation, for the changes in the gray horns and posterior nerve-roots that he found on microscopic examination are palpably artefacts, produced by postmortem injury of the cord. Had the author acquainted himself with the instructive work of Van Gieson on heterotopia, and then studied a few of the grosser and finer postmortem lesions, it never would have occurred to him to publish his findings under the above heading.]

[1] Münch. med. Woch., 1896, No. 14. [2] Jour. Nerv. and Ment. Dis., Apr., 1896.
[3] Deutsch. Zeit. f. Nerv., Bd. viii. H. 5 and 6.

Locomotor Ataxia.—Liembach[1] has made a careful study of the notes of 600 cases of locomotor ataxia occurring in the private practice of Erb. Of these, for various reasons, only 400 were found available, which is, however, a quite sufficient number for statistical purposes. He gives the relative frequency of the principal symptoms, and also the frequency with which each appears as the initial sign of the disease. The lancinating pains were, as earliest symptom, much more frequent than any other, occurring as the initial manifestation in 283 of the 400 cases. In 65 cases they occurred as second symptom, and in only 47 were they entirely wanting up to the time of observation. They remained the only symptom in some cases for from 10 to 26 years. A feeling of weakness in the legs was the first symptom in 78 cases, and the second in 113, which is somewhat surprising, as it is well known that in the early stage there is no real muscular weakness. The girdle feeling is commonly regarded as of frequent and early occurrence in this disease, but was the first symptom in only 34 cases, and the second in but 44. Paresthesia of the lower extremities is a comparatively early symptom, as it was the initial sign in 74 cases and the second in 110 cases. [It cannot be too frequently insisted upon that the presence of incoordination is never necessary to the diagnosis of locomotor ataxia. By far too many physicians give too much importance to the presence or absence of this symptom, and this assertion is borne out by the figures of Liembach.] Uncertainty in standing, even with the eyes closed, was the alleged earliest symptom in only 3 of his 400 cases, and the second symptom in only 21.

[As the symptom ataxia, or incoordination, receives too much consideration, so the slight bladder-symptoms are too much neglected. This cystic incompetence is very important, and may take the form of slight atony, so that the patient must wait a moment and strain a little to start the stream, or there may be slight dribbling of urine after urination is seemingly finished, or there may be a relative weakness of the sphincter, the patient losing a few drops before he can attend to the call of nature.] This bladder-weakness occurred in one or another form—as initial symptom 90 times, as second 119 times, and as third 74 times.

It is often stated that organic heart disease is very frequent in locomotor ataxia, so it is worthy of note that in the 300 cases in which it was examined for it was found only 6 times—viz. 2 cases of mitral insufficiency, 1 of mitral insufficiency with aortic stenosis, 2 of aortic insufficiency, and 1 of aortic insufficiency with aortic stenosis. There was 1 case of aneurysm of the aorta. All of these patients were undoubtly syphilitic.

The Distribution of Anesthesia in Locomotor Ataxia.—The study by Laehr[2] of 60 cases of locomotor ataxia with special reference to the occurrence of anesthesia and its distribution is a real contribution to our knowledge of this well-known disease, although Hetzig several years ago called attention to the facts elucidated. In only 5 of the 60 cases did Laehr

[1] Deutsch. Zeit. f. Nerv., 1895, Bd. vii. p. 493.

[2] Arch. f. Psych. und Nerv., Bd. xxvii. H. 3.

fail to find anesthesia of greater or less extent on the trunk, and these 5 were cases of tabes complicating general paralysis of the insane, in which the spinal affection was secondary to and much less prominent than the cerebral disease. This trunk-anesthesia, although so uniformly present, is usually not very marked, and relates more particularly to the sense of touch rather than to that

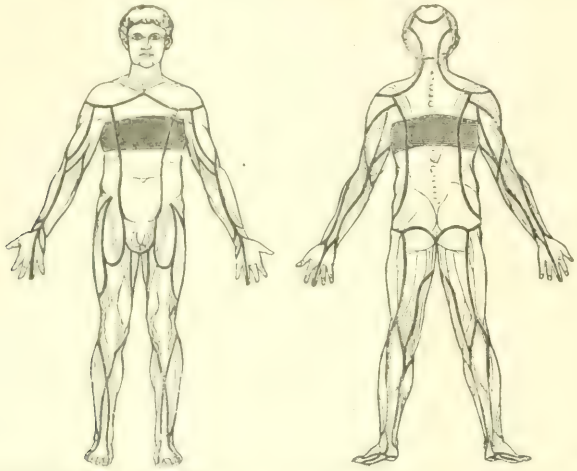


FIG. 137.—Distribution of anesthesia in locomotor ataxia (Arch. f. Psych., Sept., 1895).

of pain, in contrast to the sensory disturbance of the lower extremities, which first manifests itself as analgesia, the sense of touch often remaining normal till late in the disease. Its location on the trunk is generally at about the

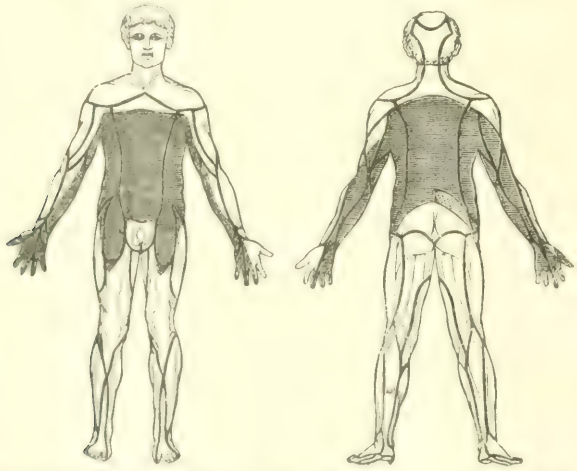


FIG. 138.—Distribution of anesthesia in locomotor ataxia (Arch. f. Psych., Sept., 1895).

level of or just below the nipple, in the form of a band reaching from the spine around to the middle line in front, and is nearly always bilateral, but the bands on the two sides may not be of equal width. In the incipient stage of the disease the bands are narrow (one or two intercostal spaces), may be incom-

plete in front or behind, the borders may be illy defined, and there may even be no distinct anesthesia, but merely an inability to locate touches with normal accuracy. When the anesthesia is very slight a prolonged examination may cause it to disappear [apparently educating it away, just as ataxics may be educated to execute movements with greater accuracy—method of Fränkel]. One of the most instructive facts elicited by the author's investigations is that the areas of anesthesia correspond not to the distribution of the cutaneous nerves, but to the spinal segments, as outlined by Thorburn, Starr, Sherrington, Head, and others. (See Figs. 137–139.) This was beautifully shown in some cases that the author was able to observe for a considerable

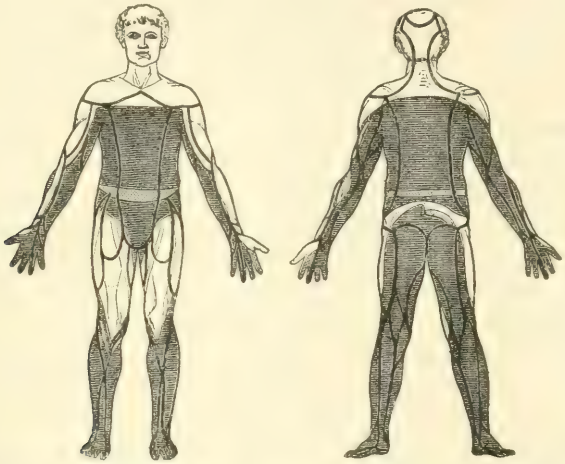


FIG. 139.—Distribution of anesthesia in locomotor ataxia (Arch. f. Psych., Sept., 1895).

length of time and watch the gradual extension upward of the anesthetic area. With great uniformity, as soon as it reached the third intercostal space it began to encroach upon the arm, at first affecting only the inner surface below the axilla, then gradually spreading over the entire inner border, and finally involving the radial side as well. He was also able to observe a similar progression downward from segment to segment. [It must not be forgotten that a peripheral neuritis, which is now known to be a not very rare complication of tabes, might cause anesthesia which would obscure the distribution of this spinal anesthesia.] It is an instructive fact that in a number of cases there were areas of anesthesia corresponding to spinal segments some distance apart, which would go to show that the pathological processes of tabes may begin in different parts of the cord at nearly the same time. It was also found that the skin at the border of the anesthetic area was often hyperesthetic to pricking, pinching, etc., and furthermore that in this hyperesthetic zone the cutaneous reflexes were very lively. The author thus explains the peculiar difference of opinion regarding the activity or absence of the superficial reflexes in locomotor ataxia. If the place we stimulate to elicit a superficial reflex (*e. g.* the sides of the abdomen for the abdominal reflexes, the inner surface of the thigh for the cremaster reflex) happens to lie within the anesthetic zone,

the reflex will be diminished or lost; if within the hyperesthetic zone, it will be lively or exaggerated. Trunk-anesthesia is a very early, but not the earliest, sensory disturbance, as some degree of anaglesia of the legs generally precedes it. Analgesia of the trunk of the ulnar nerve he finds to be much less frequent (16 in 43) than did Biernacke (14 in 20), who first described it. [See the *Year-Book* for 1896.]

Optic Neuritis in Tabes.—Bernhardt[1] contends that although choked disk may possibly occur as a part of locomotor ataxia, it is exceedingly rare, and when present is nearly always due to syphilitic lesions. He is fully in accord with those who think that tabes is, in the great majority of cases, due to specific disease, and there is nothing to prevent the occurrence of a typical syphilitic meningitis or other form of cerebral syphilis, which would cause optic neuritis in the course of tabes, but be entirely independent of it, except in a community of etiology.

In the **gastric crises** of tabes Bechterew[2] strongly recommends oxalate of cerium in the usual dose for the vomiting of pregnancy—7 to 20 gr. t. i. d.

Pachymeningitis Cervicalis Hypertrophica.—Köppen[3] reports 2 cases that put a new face upon this disease as first described by Charcot. They vary from the classical type not only clinically, but also in the postmortem findings, and would tend to show that the disease is not so exceedingly rare as has been supposed. The most striking and characteristic symptoms have always been supposed to be the extremely chronic course, severe and long-continued pain, marked atrophy limited to the upper extremities, and absence of cerebral symptoms. Köppen's first case ran its full course from inception to fatal termination in 9 months; there was entire absence of pain, only very slight atrophy limited to the scapular muscles, and there was some speech-defect and slight dementia. In the second case the lower extremities were involved: there were optic atrophy, inequality of the pupils, weakness of ocular muscles, and some mental hebetude. A very careful microscopic examination was made in both cases, which led the author to believe that the disease is often of syphilitic origin, that it is not in reality a pachymeningitis, but that the pia and arachnoid are affected equally early and extensively, and that the spinal cord itself is, through its vessels, attacked coincidently with, and not secondarily to, the membranes.

Painless Tumor of the Cord.—In this connection it might be well to mention Bailey's 2 cases of tumor of the spinal cord,[4] for in tumor of the cord, as in spinal pachymeningitis, pain is justly considered one of the most prominent symptoms and one of the most important means of localization. Case I. was a woman of 65, who died of acute pulmonary edema and Bright's disease, and purely by accident a psammoma of the spinal cord was discovered at the autopsy. The growth was intradural, between the seventh and eighth posterior roots, $\frac{3}{4}$ in. long, $\frac{1}{8}$ in. wide, and $\frac{1}{10}$ in. thick. It had caused no symptoms during life. Case II. was a woman of 29, who had had a tumor of

[1] Berl. klin. Woch. July 15, 1895.
[2] Therap. Woch., June, 21, 1896.
[3] Arch. f. Psych. u. Nerv., Bd. xxvii. H. 3.
[4] Jour. Nerv. and Ment. Dis., Mar. 1896.

unknown character removed from the abdomen by celiotomy, and another from the third rib. In the course of 6 years she had been paralyzed 3 times, all 4 extremities being affected. The last attack proved fatal some 6 months after its onset. There was at no time any pain, spontaneous or on movement, nor was there tenderness on percussion over the spine. Postmortem, a greatly degenerated gumma was found on the ventral surface of the cord, involving the first to the fourth anterior cervical nerve-roots. It was $\frac{1}{8}$ in. thick. Clarke[1] has also reported a case of tumor of the spinal canal that ran its course without pain. The growth was a soft endothelioma, was extradural, extended from the fourth cervical to the first dorsal vertebra, and involved all the posterior roots in this region. The author attributes the absence of pain to the soft character and slow growth of the neoplasm. [But, whatever the cause, it again shows that absence of pain does not exclude tumor of the spinal canal.]

Lumbar Puncture.—[We last year devoted some space to a report on lumbar puncture, and the operation continues to receive considerable attention from neurologists and surgeons.] Rieken,[2] the assistant of Quincke, who was the first to systematically employ this measure as a diagnostic and therapeutic aid in various cerebral and spinal affections, gives a full report of the 34 cases operated on from August, 1891, to April, 1895. [The paper adds but little to our report of last year (*Year-Book* for 1896, p. 644), but serves to confirm the conclusions contained therein—viz. that the operation is not dangerous, is reasonably easy to perform, may be of great diagnostic worth, but is therapeutically almost worthless.] Of the 34 cases, but 1, the last, seemed to show that the puncture and withdrawal of fluid aided recovery or possibly saved life. This case was, briefly, as follows: A child of 1 year [the age is given as 6 months in the tabular summary] became suddenly ill with convulsions, vomiting, and cyanosis, followed by fever, headache, anorexia, and tenderness of the extremities to pressure. After 10 days there was some improvement, followed by relapse with fever as high as 107° F. in the evening. (A 5-year-old brother had been sick with something similar, but was convalescent.) The attending physicians made a diagnosis of cerebrospinal meningitis, and 19 days from the onset the child was taken to the hospital. There it was found to have high fever, tenderness of muscles to pressure, and slow pulse. The patient was restless and constantly screamed. Puncture was done with the temperature at 103.1°, and 27 c.c. of turbid cerebrospinal fluid withdrawn, rich in leukocytes and other cells. Within 2 hours after the puncture the temperature was normal; it remained so, and the child made a rapid recovery. The author thinks it possible that recovery might have ensued without the operation, but even in that event believes that it hastened recovery.

A word may be added concerning the technic as practised by Quincke: A trocar and cannula (sizes 3 to 7.5 cm. long, 0.6 to 1.2 mm. thick) are employed, and the site chosen is 5 to 10 mm. from the middle line, and in children on a level with an interspinous space, in adults opposite the junction of the middle with the lower third of a spinous process. The point is directed so as to reach the

[1] Brain, 1895, Summer and Autumn No. [2] Deutsch. Arch. f. klin. Med., Oct. 25, 1895.

dura mater about in the middle line, and in adults the needle must be directed slightly upward, as the vertebral arches slightly overlap. The depth necessary to pierce the dura will vary from 2 to 7.5 cm., according to the age of the patient and thickness of the soft parts. The puncture is made in the 2d, 3d, or 4th lumbar interspace, which is, of course, below the termination of the spinal cord, and the danger of injuring the cauda equina is minimal. If the patient complain of headache, dizziness, or nausea, or there occur jerking in the legs, the withdrawal of fluid is at once stopped. It is best not to aspirate, but to let the liquid slowly run away from its own pressure. When prolonged drainage is desired a narrow lancet is passed along the cannula into the canal and a small slit made in the dura. Local edema follows this procedure, but no ill effects have been observed.

The most important contribution to the subject in this country is that of Jacoby.[1] He reports 35 cases, as many as 7 punctures being made in 1 case. They were as follows: supposed tubercular meningitis, 17; purulent meningitis, 1; meningitis with abscess, 1; tumor of the brain, 6; hydrocephalus, 4; ventricular hemorrhage, 4; spinal hemorrhage, 2; acute mania, 3. He punctures between the 3d and 4th or 4th and 5th lumbar vertebræ, using as a guide a line drawn from crest to crest of the ilium. This passes over the 4th lumbar spine. The needle is inserted about 5 mm. from the median line, although children may be punctured directly between the vertebral spines. He uses anesthesia as a convenience, not a necessity. The depth necessary to reach fluid is 2 to 6 cm., but he alludes to a case in which Goldscheider was obliged to penetrate 8 cm. (over 3 in.). Jacoby agrees with other authors that it is better not to aspirate, and that accidents are very rare, but mentions the danger pointed out by Stadelmann, that of drawing infection from the cranial cavity into a heretofore uninfected spinal canal. The operation is simple, but not altogether easy, and the author advises preliminary practice on the cadaver. A dressing of iodoform-collodion suffices. No permanent benefit was attained by the operation in any cases, a transitory amelioration in a few. In brain-tumor the withdrawal of fluid is apt to cause intense headache for about 15 minutes, followed by considerable relief. In a case of compression-myelitis with great pain Goldscheider repeatedly aspirated and injected a solution of cocain into the dural sac, but to no purpose. Freyhan punctured in 1 case supposed to be tubercular meningitis; tubercle-bacilli were found in the fluid and the patient recovered, but this case is unique thus far. The procedure, however, is of undoubted diagnostic value. The character of the fluid may give valuable information. In tumor and abscess of the brain the fluid contains only 0.4 to 0.8% of albumin and does not spontaneously coagulate, while in meningitis it contains about 1.6% of albumin and a coagulum spontaneously separates. Lichtheim's first employment of the method for purposes of diagnosis will illustrate its possibilities: A patient with otitis presented cerebral symptoms; fluid removed by puncture contained streptococcus pus, and therefore a diagnosis of meningitis was made, which was confirmed by autopsy. Jacoby had a similar

[1] N. Y. Med. Jour., Dec. 28, 1895, and Jan. 4, 1896.

case in which the diagnosis lay between abscess alone and abscess complicated with meningitis. Lumbar puncture revealed pus; operation was consequently discountenanced, and the autopsy revealed abscess of the cerebellum and purulent meningitis. He found tubercle-bacilli in 11 of the 17 cases of suspected tubercular meningitis, but as autopsies were not obtained positive conclusions cannot be drawn. He had 1 case, however, in which the correct diagnosis of tubercular meningitis was made by means of the puncture before the symptoms of the disease were sufficiently advanced to make a diagnosis possible. It is to be remembered that in a few cases in which meningitis was confined to the brain the withdrawn fluid was perfectly normal. Two of Jacoby's cases are exceptional: A woman of 22 after a fall upon the buttocks and lower part of the spine rapidly became completely paraplegic, with anesthesia, loss of reflexes, and retention of urine. She was punctured between the 4th and 5th lumbar vertebræ, and about 15 c.c. of dark blood were drawn off. Thirty minutes after the operation the anesthesia had improved, but motion was unaffected. In 24 hours she could move both legs; the third day she recovered power over the bladder, and in 2 weeks was nearly well, but several months later still showed some "weakness in the peronei and extensors of the ankles and absent knee-jerks." A young man was violently thrown from a bicycle against a stone fence. There was immediate weakness of both legs, with slight anesthesia and incontinence of urine and feces. Puncture was done about 24 hours after the accident between the 3d and 4th lumbar vertebræ, and about 20 c.c. of dark fluid blood withdrawn. There was no immediate effect, but he began to improve on the fourth day, and 4 weeks after the injury had completely recovered except for slight anesthesia about the perineum and genitals and some impairment of motion of the toes. The author closes as follows: "As a result, therefore, of my experience and that of others, we may summarize the acquired facts as follows: By means of lumbar puncture cerebrospinal fluid can be easily removed from the subarachnoid sac of the spinal cord and from the cavities of the brain. Therapeutically, it is only of direct value as a palliative through the reduction of increased pressure; it may perhaps prove of more service indirectly as the first step to local treatment of the cord and brain. Diagnostically, it possesses great clinical advantages in the diagnosis of the various inflammatory affections of the cerebral membranes and in the recognition of intraventricular hemorrhage, as well as of hemorrhage within the spinal canal. From the facility with which this little operation can be carried out it should not be long before lumbar puncture will form a part of the routine work of every practising physician."

The following case of Kiliani[1] and the 2 of Jacoby just cited are probably the only ones of the kind on record: A man of 45 fell 20 feet, striking on his back; on examination 13 hours later he was found to be paraplegic, including paralysis of the bladder and rectum, and anesthetic below the level of the 3d lumbar vertebra. For 5 days there was absolutely no change, when lumbar puncture was performed between the 3d and 4th vertebræ

[1] N. Y. Med. Jour., Mar. 14, 1896.

and 8 c.c. of tar-like blood withdrawn. One hour after the operation the anesthetic zone was smaller and in some places less pronounced, and there was slight motor improvement. The condition then remained stationary for 4 days, when the patient suddenly died of asphyxia while the bed was being changed.

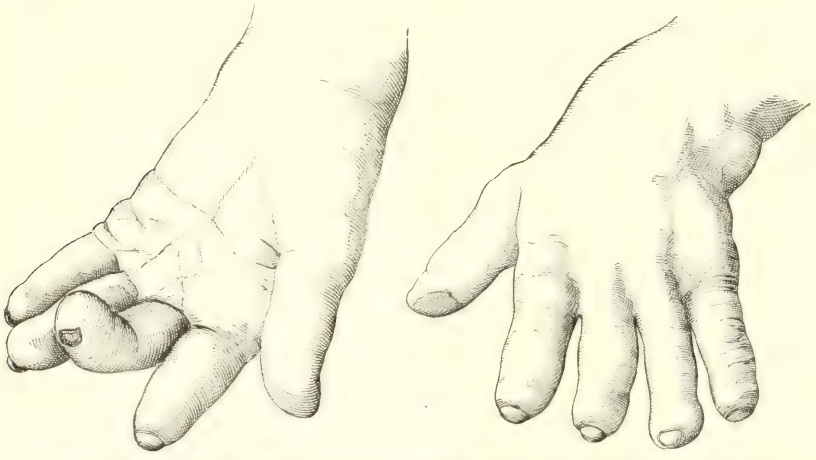
The subject of lumbar puncture was rather extensively discussed at the last German Congress for Internal Medicine,[1] and was introduced by Lenhartz, who had performed the operation 230 times on 126 patients. He places the patient on the side and punctures in the middle line between the 3d and 4th lumbar vertebræ. Regarding the information to be thus gained he says: 1. It allows of a good estimate of the amount and pressure of the cerebrospinal fluid. 2. The proportion of albumin in the fluid is of diagnostic value. Over ¼ to 1000 speaks for the presence of inflammation, with some exceptions, as 2 to 4 per 1000 has been observed in tumor and apoplexy. 3. The specific gravity of the fluid is of no import. 4. The presence of numerous cells indicates inflammation. 5. The presence of tubercle-bacilli is positive evidence of tubercular meningitis. In the last 9 of 19 cases examined they were found. To facilitate finding the bacilli Lenhartz allows a bit of absorbent cotton to sink into the fluid, where it becomes permeated by the germs, and is then tapped out on the cover-glass. In epidemic cerebrospinal meningitis diplococci are found free or in the cells; also streptococci. 6. The color of the fluid is of small value; *e. g.* in cerebrospinal meningitis it may be purulent, seropurulent, slightly cloudy, or perfectly clear. It is bloody principally in pachymeningitis and head-injuries. Therapeutically, he uses puncture in—1. Acute and chronic serous meningitis; 2. Severe chlorosis with pronounced nervous symptoms; 3. Acute cerebral edema caused by injuries to the head; 4. He has also seen some relief in brain-tumor. Krönig found tubercle-bacilli in 4 out of 5 cases of tubercular meningitis. He had seen relief in serous meningitis, the headache of chlorosis, and in 1 case of acute meningitis. Goldscheider uses the same technic as Lenhartz, avoids aspiration, has seen no evil results, and found the tubercle-bacillus in 3 cases: they were, however, cases in which the diagnosis was not difficult. In epidemic cerebrospinal meningitis he had generally found increased tension, but seldom pus. As opposed to the opinion of Lenhartz, he thought increased pressure of some importance, and in answer to a question raised by him said there was such a thing as serous meningitis, but it was rare. He had found puncture to afford only transient relief of symptoms. Schultze believed in spinal puncture for chlorosis, calling it "white phlebotomy" as opposed to "red phlebotomy," which had been recommended in this affection. He had seen subsidence of most threatening symptoms in tubercular meningitis after puncture, but thought that in brain-tumor trephining afforded more relief from pressure. In 1 case of enormous hydrocephalus he had seen the fluid only drop very slowly. Ewald called attention to the fact [noted in the *Year-Book* for 1896] that sudden death had followed puncture in cases of brain-tumor.

[1] Neurolog. Centralbl., May 15, 1896.

Hansemann supported Goldscheider in affirming the existence of a serous meningitis, as he had seen 2 cases postmortem. Lenhartz in closing said that when the pressure of the fluid fell to 60 mm. of water he terminated the operation. He thought the slow dropping of fluid noticed by Schultze was due to occlusion of the cannula. He never used an anesthetic. With one exception he had seen no ill effects; generally there is immediate relief of headache, dizziness, and vomiting. The exception was a case that suddenly terminated fatally 4 hours after tapping.

Syringomyelia.—[Syringomyelia has, until quite recently, been considered to rank among the clinical curiosities, and is, we have reason to think, still unknown to some physicians.] Dimitroff[1] in reporting a new case has collected from the literature of about 8 years (from 1887 to October, 1894) observations of 297 cases. Of these, 7 cases do not properly belong in this category, and of the 201 cases studied only clinically, some may have been incorrectly diagnosed, but 61 cases were observed clinically and postmortem, and 23 were only studied after death—a total of 84 autopsies.

Syringomyelia and Morvan's Disease.—[It is now very generally conceded by neurologists that Morvan's disease is identical with syringomyelia, although the fact that Morvan has been able to collect such a large number of cases from the comparatively small population of Brittany remains unexplained.]



FIGS. 140, 141.—Deformities in Morvan's disease (Neurolog. Centralbl., May 15, 1896).

Bielschowsky[2] reports a case from Mendel's clinic under the title of Morvan's disease, and then proceeds conclusively to show that it is none other than syringomyelia. The patient, a woman of 40, was seen 6 years after the beginning of the affection, and showed the typical trophic changes of Morvan's disease—viz. loss of phalanges following painless whitlows, marked arthropathy of one wrist-joint, and slight affection of both shoulder-joints (see Figs. 140, 141) There was also some trophic change in the skin, and above the left elbow a

[1] Arch. f. Psych. u. Nerv., Bd. xxviii. H. 2.

[2] Neurolog. Centralbl., May 15, 1896.

scarlike fold not unlike Dupuytren's contracture. [This patient had never been exposed to trauma of any kind, and the case offers all but conclusive evidence that the arthropathies, whitlows, etc. of syringomyelia are a truly trophic trouble and depend in no wise upon the analgesia, as has been suggested by some.] (See following case.)

Korb[1] reports a case of syringomyelia with careful postmortem examination. Although typical, it is of unusual interest as showing to a marked degree the changes described by Morvan in the affection named after him. (See Fig. 142.) The trophic affection of the bones and connective tissue was marked, whereas the muscular atrophy, so frequent and generally so pronounced in syringomyelia, was almost wanting. This is interesting and instructive in view of the fact that the disease-process in the cord was limited to the central part and posterior horn, the anterior part of the cord being intact. [This would indicate, to us, a different location of the trophic-cord centers for muscles and bones, and we cannot at all agree with the author in attributing the deep and extensive bone-changes entirely to infection from the ordinary accidents of daily life, which progressed to this serious degree simply because the conservative warning of pain was absent. (See preceding case.) This theory would not account for the cases in which the first of a series of whitlows is painful, the second less painful, and the others painless. Such cases are not extremely rare. We have seen 2 such. The case is of interest as showing some anesthesia to touch, formerly supposed to be always absent, now known to be at times present, in syringomyelia, and a delay in pain-conduction which has been but seldom mentioned in this disease.]



FIG. 142.—From hand in Morvan's disease (Deutsch. Zeit. f. Nervenheilk., June 2, 1896).

[It should be remembered that anesthetic leprosy may very closely resemble syringomyelia, especially of the type of Morvan, and since the investigations of Zambaco a few years ago it is reasonably certain that some cases before thought to be syringomyelia, and even some of the cases seen and reported by Morvan, were indeed cases of leprosy.] Presumably such a case is reported by Prus,[2] although neither the history nor the symptoms were typical of syringomyelia. In the blood the author found a bacillus that he considered to be the lepra-bacillus. The deformities of the fingers produced by painless whitlows could be easily mistaken for those of Morvan's disease.

A very unusual case is that reported by Thomas[3]—a boy of 6, whom he considered to be suffering from syringomyelia of the Morvan type. Although the child had the deformed fingers and thermoanesthesia, the course and symptoms of the disease were sufficiently atypical to make the diagnosis doubtful.

[1] Deutsch. Zeit. f. Nerv., Bd. viii. H. 56. [2] Arch. f. Psych. u. Nerv., Bd. xxvii. H. 3.
[3] Rev. méd. de la Suisse Rom., No. 11, 1895.

[It must not be forgotten that dissociation of sensation, loss of temperature-sense, and analgesia, with preservation of sense of touch, are sometimes found in disease of the peripheral nerves and in lesions of the spinal cord other than syringomyelia. Indeed, Pic and Regaud have reported their occurrence in compression of the cord from Pott's disease, when the autopsy showed no lesion of the cord whatever.]

Landry's Paralysis.—The most important contribution of the year to the study of acute ascending paralysis is that of Pearce Bailey and Ewing.[1] They give the report of a case, complete clinically and pathologically [and what is of peculiar value in their work is the examination of the spinal cord by means of the latest and most approved technic—Nissl's stain]. The clinical history is sufficiently typical: A woman of 36 years, a beer-drinker, with negative previous history and examination of whom was negative as regards evidence of syphilis, was attacked Nov. 19 with vomiting. This continued, and on the third day she went to bed in an exhausted condition. She had, too, occasional attacks of vertigo and fainted on attempting to rise from bed. On the next day (Nov. 23d) she rather suddenly lost power in the legs, and on Nov. 24th there were added paralysis of the left arm and paresis of the right. Sensation was normal. On examination Nov. 25th the pulse was found to be 100 and regular, the temperature 101.4° F., the respirations 28, the urine of a specific gravity of 1.030, free from albumin, but containing a few hyaline casts, the thoracic and abdominal viscera normal. Both legs and the left arm were completely paralyzed, and the right arm nearly so. There was some left ptosis. Sensation was normal, there was no pain or tenderness, the sphincters were intact, and the reflexes were lost. Electric examination the day before death showed diminished faradic response. Nov. 26th she vomited repeatedly and was sleepless, and on the 27th she complained of headache and dyspnea. On the 29th the urine contained a trace of albumin, the dyspnea increased, dysphagia appeared, and during the day advanced to aphagia; there was marked dysphonia, and the patient died that evening, 10 days after the beginning of the vomiting and 6 days from the onset of the paralysis. The autopsy disclosed "congestion and edema of the lungs; acute degeneration of the liver and kidneys; acute hyperplastic splenitis." To the naked eye the nervous system presented nothing abnormal. Microscopic examination of the cauda equina, nerve-roots, and spinal meninges was negative, except for the presence of slight circumvascular infiltration of round-cells. The gray matter of the spinal cord was extensively affected throughout the entire length of the cord, being much more involved in some areas than in others. The lesion consisted in intense congestion of all the blood-vessels, especially of the ramifications of the central branch of the anterior spinal artery. In the cervical region there were several capillary hemorrhages, and some of the arterial twigs contained thrombi composed of multinuclear leucocytes. Nearly all the vessels showed a pronounced circumvascular infiltration with small round cells. In some places this infiltration had extended beyond the circumvascular sheath, and the small cells were gathered in such

[1] N. Y. Med. Jour., July 4 and 11, 1896.

numbers as to form what may be properly regarded as miliary abscesses. Furthermore, there was a diffuse cellular infiltration in the gray matter, which sometimes extended slightly into the white matter. At some levels congestion and exudation were so intense that nothing could be distinguished but the round-cell infiltration and the detritus of neuroglia- and ganglion-cells. Where the process had extended into the white matter, as was observed in the cervical region only, the fibers were absent, and their places occupied in part by large mononuclear cells, with homogeneous or granular protoplasm.

Before detailing the degenerative processes in the ganglion-cells, it may be well to briefly describe a normal human ganglion-cell of the anterior horn as it appears when stained by Nissl's method (Plate 11, Fig. 1). The cell-body under these conditions contains a number of chromophilic masses, larger and grouped concentrically about the nucleus, arranged in rows along the cell-borders and prolonged as slender rods into the dendrites. These bodies are not found in the axis-cylinder process. The significance of these chromophilic bodies is not known, but they are believed to be a characteristic and normal element of the ganglion-cell. Besides these bodies, smaller granules are scattered through the cytoplasm, giving the appearance of a fine network. Some areas of diffuse, structureless, greenish pigment are often encountered in normal ganglion-cells of the adult, a feature which is much more conspicuous in old age (Plate 11, Fig. 2). By this method of staining, the nuclear membrane is distinct, and is separated from the deeply staining nucleolus by a clear area in which may occasionally be made out a fine granular network.

The abnormities in the ganglion-cells observed in the present case consisted principally in the partial or complete absence of the chromophilic masses (Plate 11, Figs. 3 and 4). In cells in which the lesion was least marked the absence of chromphilic bodies was noted only in the central portions of the cells. Other cells were seen in which the cytoplasm was entirely bereft of chromophilic bodies, and their places were occupied by a multitude of fine, rather deeply-staining granules, which gave to the cell-body a very peculiar "dusty" appearance. Further, in many cells even the finer bluish particles were absent, and in these cells especially, less often in the others, the nuclear membrane was indistinct, irregular, or granular, and the nucleolus fragmented or absent (Plate 11, Fig. 5). Finally, in the areas where evidences of exudative inflammation were most pronounced, many shrunken and irregular cell-bodies and collections of deformed chromophilic bodies without visible cell-nuclei were with difficulty to be recognized. The fragmentation of cell-processes, as observed by Oettinger and Marinesco, was occasionally encountered, but in such situations as to render its pathological significance uncertain. The cells of Clarke's columns were only slightly affected, and offered a sharp contrast to the intensely inflamed anterior horns. The sacral region and conus medullaris were the least affected portions of the cord, and were in places almost normal, which would readily explain the integrity of the sphincters. The changes in the gray matter throughout the entire cord were but slightly marked in the posterior horns. The lesions in the medulla and pons were chiefly marked in

PLATE II.

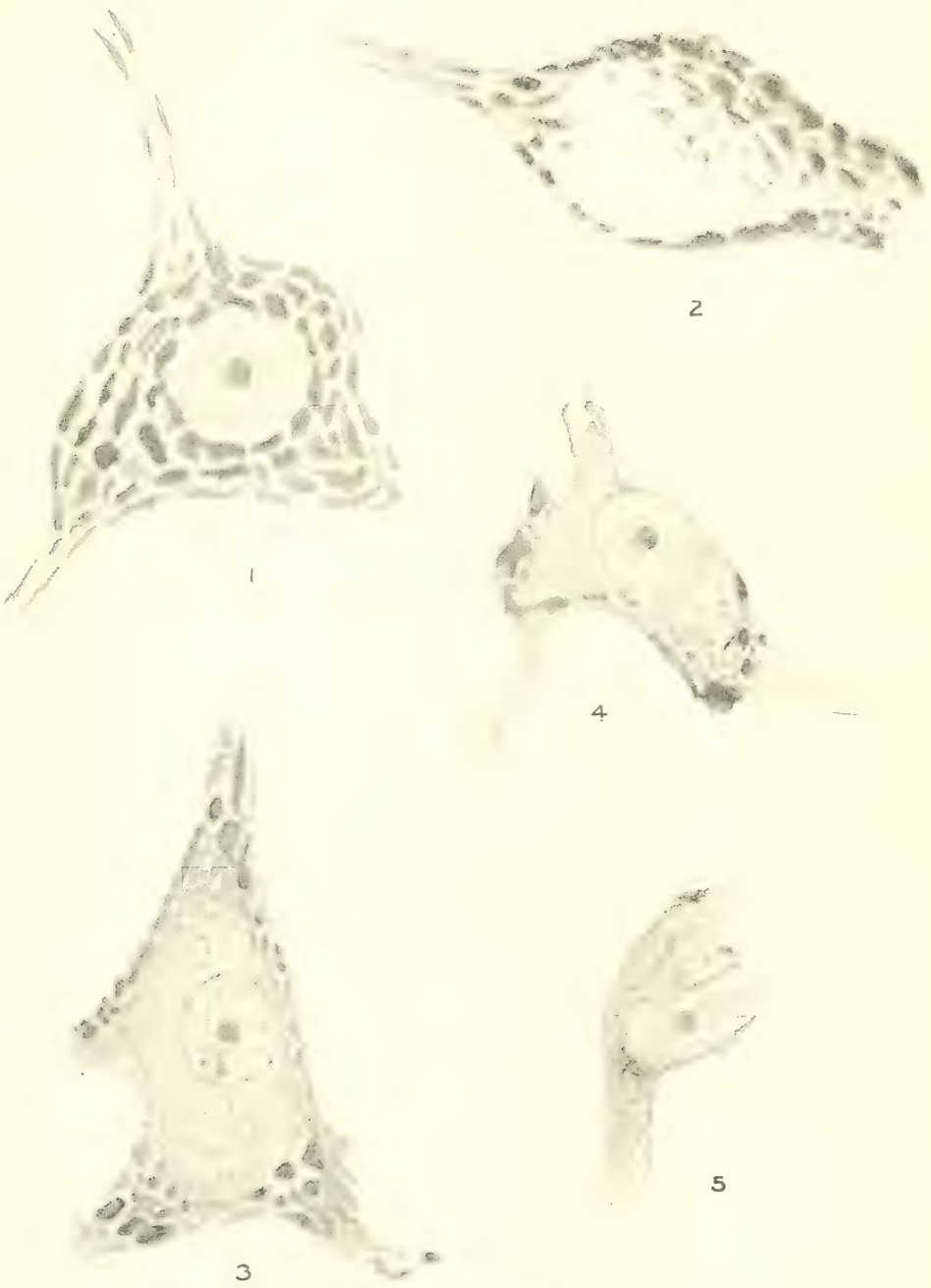


FIG. 1.—Normal human ganglion-cell of the anterior horn of the spinal cord. FIG. 2.—Increase of pigment in the senile ganglion-cell. FIGS. 3-5.—Degenerative changes in the ganglion-cell. (N. Y. Med. Jour., July 16, 1896.)

the gray matter along the floor of the fourth ventricle and in that of the pons, although the white matter and periphery were not entirely uninvolved. The changes were similar to those described in the cord. The nuclei of all the cranial nerves were more or less damaged, those least affected being the sixth and seventh. The changes in the nuclei of the third nerves were chiefly in the ganglion-cells which lie internally. The nucleus funiculi teres was but little affected. The basal ganglia showed the circumvascular lesions and numerous small foci of cellular infiltration. The internal capsule was intact, but the motor cortex presented the same small collections of round-cells and ganglion-cells in the milder stages of degeneration. The temporosphenoidal lobes were normal. The marked lesions of the medulla extended slightly into the middle peduncles and the lateral lobes of the cerebellum.

No bacteriologic examination was made either by culture or by animal inoculation. Sections from various levels were stained by Löffler's alkaline methylene-blue and by Gram's method, but no bacteria were found. [It is greatly to be regretted that the peripheral nerves were not examined, for the terminal filaments, and even the nerve-trunks, may be degenerated when the nerve-roots remain normal.] In addition to their original work the authors give a critical review of all carefully observed cases of Landry's paralysis in which an adequate microscopic examination was made. [It is the most judicial and advanced review of the subject with which we are acquainted, but for the sake of brevity we shall confine ourselves to their conclusions, which follow :] "Acute ascending paralysis is an acute toxemia in which the poisonous agent affects chiefly the nervous system.

"The commonest seat of the lesion is in the spinal cord and in the medulla, and it may be present in the cortex and in the nerve-roots. When in the spinal cord the lesion is that of acute anterior poliomyelitis—namely, an acute exudative inflammation following the distribution of the central branch of the anterior spinal artery, with cellular infiltration of the circumvascular sheaths, degeneration of ganglion-cells, loss of structural elements, and with or without degeneration of the anterior roots. The lesions in other parts of the cerebrospinal axis are of a similar nature.

"The evidence that the lesion of typical Landry's paralysis may exist in the peripheral nerves alone is based upon a single case reported 20 years ago by Dejerine. When the lesion affects the peripheral nerves there are increase of neuroglia-cells and degeneration of nerve-fibers.

"It is at present impossible to deny that acute ascending paralysis may run a fatal course without leaving demonstrable histological changes in the nervous system. It is certain that the cases with negative pathological report did not present the marked vascular lesions of acute anterior poliomyelitis, but it seems probable that in these cases there were changes in the ganglion-cells demonstrable by delicate methods. From present data it seems to us impossible to distinguish by the clinical symptoms the different types of lesions."

[A goodly number of cases are reported as Landry's paralysis that are simply typical cases of multiple neuritis affecting the lower extremities before

the upper.] Such an one is that of Bowie.[1] A lad of 17, after exposure and influenza and exposure again, rapidly became weak in the legs, and then arms, with some pain and soreness. There was moderate anesthesia of the feet, loss of the knee-jerks, and intact sphincters. Improvement was rapid, so that in 2 months he was able to walk. A similar case is the 1 reported by Pailhas.[2] The weakness in the legs appeared coincidently with what was supposed to be influenza. The patient began to improve at the end of 2 weeks, and the disease ran the ordinary course of multiple neuritis except for a slight recrudescence caused by exposure to cold. Diller and Meyer[3] report a case as one of acute ascending paralysis, which ran a course of more than 3 months before the fatal termination. The only postmortem finding was moderate degeneration of the pyramidal tracts. [As the brain and peripheral nerves were not examined, the case is very incomplete, and it is exceedingly doubtful if it should be classed as one of Landry's paralysis.]

MENTAL DISEASES.

Mental Changes in Graves' Disease.—Maud[4] points out the changed mental state in cases of Graves' disease, dwelling especially upon their motor restlessness, which sometimes almost imitates a chorea, and which is present in subacute mania and neurasthenia. Its value is that it expresses their mental attitude as well. They are very subject to fright—often have hallucinations of sight and sometimes of hearing. The memory is usually much impaired. Their mental processes are fragmentary, so that Sir James Russell Reynolds has denominated it a chorea of ideas. They have no fixity of attention, and often present a distinct tendency to melancholia. Hysteria and the psychic changes of hysteria are frequently present among them, and in rare cases the disease is marked by the development of acute mania.

The Breaking-strain of the Ribs in the Sane and Insane.—Campbell[5] gives the results of carefully conducted experiments to determine the breaking-strain of ribs in cases that had suffered from mental disease and those not thus affected. He gives the average breaking-strain of the ribs of 58 insane patients, for males, 41.04 lb. against the convexity, while in 50 cases of the noninsane the breaking-strain was 42.73 against the convexity. For females the proportion was 20.68 lb. against 23 lb. These figures tend to show that the influence of chronic wasting diseases in hospital and other similar cases is practically equivalent to that attributable to mental disturbance. In general paresis, however, there was an unequivocal diminution of the resisting power of the ribs, their breaking-strain falling in some cases below 20 lb. in the male. Microscopic examination also disclosed architectural deficiencies.

The Polyneurotic Psychoses.—Ferrari[6] discusses the mental disturb-

[1] Lancet, Apr. 4, 1896.
[2] Arch. de Neurol., Dec., 1895.
[3] Am. Jour. Med. Sci., Apr., 1896.
[4] Med. Press, London, Sept. 4, 1895.
[5] Brit. Med. Jour., Sept. 28, 1895.
[6] Revista Sperimentali di Freniatria e di Medicina Legale, translated for the Alienist and Neurologist, Jan., 1896.

ances that frequently occur in multiple neuritis, and which have been denominated by some as a special form of psychosis under the term polyneuritic psychosis. He points out very pertinently that this mental disturbance only occurs in a polyneuritis that is the result of some particular poisoning, especially lead and alcohol, and denies its being a special mental manifestation, but that it is characteristic of the particular poison only. The article, however, reviews the question of psychical disturbance associated with multiple neuritis, and lays stress upon the peculiar character that usually dominates it—namely, the memory disturbances. Quiet cases of delirium tremens present precisely the same picture that is shown in the mental disturbance of alcoholic multiple neuritis, with the addition only of hallucinations. The mental disturbance of lead-poisoning, whether polyneuritis be present or not, is always the same. The main consideration is that a diffuse poison does not elect certain elements of the nervous system to the exclusion of all others, and the discussion goes to show that the arbitrary distinction of central and peripheral disease must be given up.

The Knee-jerk in Psychiatry.—Cramer[1] reports results of the study of 2384 cases, from which the following conclusions, among others, were drawn: Progressive paralysis is the only form of insanity with a definite relation of the knee-jerk in a certain proportion of cases. Absence of the knee-jerk in cases of insanity in which alcoholism, exhausting excitement, and severe lesions of the nervous system can be excluded should arouse suspicion of general paralysis, and is therefore a symptom pointing to bad prognosis. In the convalescence of mania, or in chronic mania, or in the acute forms of paranoia, and the alcoholic psychoses, absence of the knee-jerk is only of bad prognosis when signs of extreme collapse are present. Increased knee-jerk is only of bad prognosis when combined with advanced idiocy or symptoms of general paralysis. Increased knee-jerk is only rarely important in differential diagnosis. In the course of chronic paranoia increase of the knee-jerk with other symptoms points to an exacerbation. Neurasthenia seems always to be accompanied by increased knee-reflex. Cases of general paralysis with absent knee-jerk seem to have a longer course, with more marked depression and with rare periods of excitation. Absence of the knee-jerk after epileptic attacks allows the exclusion of simulation. Smith called attention to the great value of Sommer's instrument for registering the knee-jerk. Mendel said that he had failed to get the knee-jerk in only 1 case of functional psychosis. In this case, 1 of apparently recent mania, the patient recovered, but in 2 years proved to be paretic. Mendel prefers the terms "strong" and "weak" to "increased" or "decreased" as applied to the knee-jerk.

Heredity and Alcoholism.—Le Gendre[2] again takes up this question and presents it in an instructive manner. He points out that clinical observation teaches that the children of alcoholic parents may possess either an innate desire for drinking alcohol or purely functional troubles of the nervous system

[1] Neurolog. Centralbl., 1895, No. 19; Am. Jour. Med. Sci., Jan., 1896.

[2] Rev. prat. d'Obstét. et de Pædiat., Sept., 1895.

or organic lesions of the nervous centers. The taste for alcoholic drinks remains in abeyance, like many other hereditary aptitudes, until some occasion leads to its manifestation. The tendency usually appears between 15 and 25 years of age with boys; girls also experience this imperious desire for drink, but less frequently.

The dynamic troubles of the nervous system which may appear in the descendants of alcoholic parents may implicate any or all of their functions. Moral sensibility is affected. They are impressionable and emotional. Often sensibility to pain is modified symmetrically in the extremities, especially in the direction of exaggeration, but sometimes it is diminished. Reflex excitability is exaggerated, and explains the tendency to the frequent incontinence of urine. Hysteriform and epileptiform convulsions are not rare as the result of slight exciting causes. Nocturnal terrors are frequently observed among such children. Disturbances of the mental faculties are cited. He speaks of the arrest of a normal development of the intelligence, especially after early years of precocity, and cites the growing number of adolescent assassins. The author then calls attention to the anatomic lesions of the nervous centers among this class, which are frequently observable in the fetus and render development of the brain impossible in part or in whole, producing anencephaly, hydrocephaly, and porencephaly, and slighter degrees of developmental difficulties. This may only manifest itself at the period of adolescence and puberty, but indicates that the organs started out with lessened capacity for development. The author calls especial attention to epilepsy. In 60 families where the parents were alcoholic there were 301 children; of the 169 that survived early life, there were 60 epileptics. He calls attention to the statement of Lancereaux, who long ago pointed out the special physical conformation of such offspring. Ordinarily of slight stature, poorly developed, the skull and upper portion of the face is usually asymmetrical. Sometimes one-half of the body is atrophied, the head is small, the facial expression sad. He calls attention to the experience of recruiting officers in a wine district, who noticed a diminution in the stature of recruits born in a certain year. This is explained by the fact that during that year the vintage failed and brandies were substituted as the daily beverage. He refers to Morel's observations that the use of strong alcoholic drinks in youth has a tendency to induce infantilism. In a somewhat similar way he discusses the descendants of those poisoned with lead and morphin. Transmission occurs especially if the subject of the intoxication is the mother, but is less pronounced when the male parent is affected. [While the article is a special plea from the author's point of view, it is suggestive, and brings a lot of material again into line showing that unfavorable conditions in the parent are bound to be more or less manifest in the offspring.]

Katatonia.—Kraepelin[1] recognizes katatonia as a definite morbid type, and has studied it with a view to ascertaining its actual prognosis and course.

[1] Versamml. des Sudwestl. Deutschen Psych. Vereins in Karlsruhe, 9 Nov., 1895; Allg. Zeit. f. Psych., lii. vi. p. 1126; Am. Jour. Insan., Apr., 1896.

In 63 well-marked cases, females predominating, there were 24 that had remissions; 14 of these relapsed; for the others the time was yet too short to say what the outcome would be. Twice 2 relapses and once 4 were observed. During the remissions there was only in 1 case a claim by the friends of complete mental health. The relapses generally occurred within 5 years, occasionally longer; the mental weakness was more marked each time. The disorder resembled paresis in this, with which it is otherwise also comparable, and its general tendency seems to be toward dementia. Kraepelin sums up his conclusions as follows: 1. Remissions are common in katatonia, especially in the male sex; their duration may be for years, even over 10 years. 2. During the remission the mental restoration is not complete; some peculiarities (constrained, emotional, or especially quiet disposition, irritability) still remain. 3. An individual that has been once affected with katatonia has a great chance of a relapse sooner or later. 4. We have to deal with an organic cerebral disorder, tending to a more or less pronouncedly serious condition of dementia.

Craniotomy for Idiocy.—Dana[1] reviews this operation, and reaches conclusions which are rather fully borne out by the experience of others in this field and by a certain number of cases under our own observation. He properly insists that craniotomy for idiocy is justifiable in certain selected cases. These are microcephalic idiots in whom there is no evidence of patent fontanels at birth, and those in whom hereditary syphilis, rickets, and tuberculosis can be excluded; also extreme cases of microcephaly are not to be selected, as this implies cerebral agenesis. The method by which improvement is brought about is largely surgical and pedagogic. Every such operation must be followed up by persistent and intelligent attempts to educate such children. The operation may sometimes be repeated with benefit. In epileptic cases it is not always attended by immediate cessation of the fits and the appearance of benefit, but these may occur later.

A Family Form of Idiocy.—Sachs[2] again calls attention to this disease, and refers to cases formerly reported by him under a different caption. So far, in his own observation and that of others, including the cases of Kingdon, Carter, Magnus, and Goldzieher, 19 cases are known. The chief symptoms of the affection are mental impairment observed during the first few months of life and leading to absolute idiocy; paresis or paralysis of the greater part of the body, which may be flaccid or spastic; the reflexes may be deficient or increased; a diminution of vision terminating in absolute blindness, with changes in the macula and later an optic-nerve atrophy; marasmus leads to a fatal termination at about the age of 2 years. The affection is marked by its occurrence in several members of the same family. It must be differentiated from hereditary syphilis, and sometimes presents a somewhat similar picture. For this disease he proposes the name of amaurotic family idiocy.

The Etiology of General Paralysis.—Hirschl[3] has obtained the fol-

[1] Therap. Gaz., May 15, 1896. [2] N. Y. Med. Jour., May 30, 1896.

[3] Berl. klin. Woch., 1895, No. 45.

lowing results and conclusions from an analysis of 200 cases: In 56% of cases there was a clear history of syphilis, in 25% it was probable, and in only 19% a history of syphilis could not be discovered. Soft chancres were not used in this investigation as proving the existence of syphilis. In 78 cases in which the time of infection could be fixed the interval between that and the appearance of paralysis varied from 2 to 29 years. The author thinks the cause of general paralysis is a single one, on account of the similarity of the symptoms and of the anatomic process, the latter being a diffuse encephalitis and periencephalitis. The question whether this cause is syphilis requires some explanation of the 19% of cases with negative histories. This the author disposed of by taking the histories of 63 cases with late syphilitic lesions, and finding that in only 54% was there a history of syphilitic infection, in 9.5% it was doubtful, in 36.5 there was none at all. The anatomical changes in paresis were compared with those of syphilis, especially with the interstitial hepatitis of late syphilis. Finally, some of the symptoms of paresis were found to occur in syphilis, such as reflex immobility of the pupil, double vision, optic atrophy, ophthalmoplegia, and tabes; the symptoms of general paralysis were claimed to be favorably influenced by antisyphilitic treatment, and the prevalence of the two diseases was adduced to further prove their relationship.

Juvenile Paresis.—Alzheimer[1] discusses the subject of early paretic dementia—the developmental general paralysis of Clouston and others. He analyzes 38 cases found in the literature, and adds fully detailed accounts of 3 personal observations of his own. He finds that, as regards its etiology, syphilis plays a predominant, if not, indeed, an exclusive role; that hereditary predisposition seems to favor it, and traumatism may be the immediate cause of the outbreak of the symptoms. Clinically, the tendency is toward a form of chronic dementia, without delusions, though other psychic symptoms may occur, but generally as transient phenomena. The course and prodromal stage are rather longer than in the adult type. The paralytic symptoms generally appear early, and are prominent throughout. Hemiplegias, paralytic strokes, tabetic symptoms, optic atrophy, etc. are, relatively, rather frequent. The microscopic postmortem findings are similar to those in other forms, and the same is true of the finer lesions. In 2 of his own cases he found pronounced degenerative changes in the basal ganglia.

While the cases reported show many peculiar features, they are not, in his opinion, such as would authorize us to erect them into a special clinical type. Aside from the youth of the subjects, all the peculiar features are met in different cases of paresis of older persons. This form, however, he holds, throws a certain important light on the pathology. The usual causes, other than syphilis, to which paresis is attributed—grief, care, over-strain, the struggle for existence—fail here; the paresis occurs at an epoch when physical and psychic stress are at a minimum, and the influence of syphilis is all the more marked. The developmental changes, credited by Clouston and others, can

[1] Allg. Zeit. f. Psych., lii. No. 3; Am. Jour. Insan.

hardly play a part as early as the ninth year (at which age some of the cases began), and therefore Alzheimer rejects these as an especially important factor.

Regis[1] reports 2 new cases of general paralysis with hereditary syphilis. He believes that facts of this kind show conclusively that hereditary syphilis invariably exists in juvenile general paralysis, but that in order to find it we must hunt for it without allowing ourselves to be stopped by the difficulties that attend such search. Adding these cases to Alzheimer's statistics, it will be seen that of 42 unmistakable, well-authenticated cases of juvenile general paralysis there were 37 with histories of syphilis (hereditary), in 29 of which its existence had been established with certainty, and in 8 it was probable. The father of 2 of the patients presents a cerebral condition bordering upon general paralysis. The question naturally arises if there is not some special condition which allies juvenile general paralysis to hereditary or family forms of organic affections of the nervous system.

Bresler[2] analyzes 40 cases of general paralysis collected by Ziehen under the age of 20, and reports a typical case in a girl 13½ years in which the only bad hereditary symptom mentioned is insanity in uncles and aunts. He finds that girls are more subject to juvenile general paralysis than are boys.

Vertebral Puncture in General Paralysis.—John Turner[3] gives his experience with vertebral puncture in a number of cases of general paresis for the purpose of lowering the supposed excessive intracranial pressure by this means. He refers to the cases reported by Batty Tuke in which operation was done upon the cranium for the relief of this alleged pressure. The lumbar puncture was used in 14 cases without discovering the increased pressure anticipated, and without producing any important results. He concludes that in fairly advanced cases of general paralysis such pressure as that postulated by Batty Tuke and Claye Shaw does not exist, and further states that the examinations of the fluid obtained by lumbar puncture are not in support of the supposition that they are the result of an inflammatory process.

Thyroid-feeding in Insanity.—Bruce[4] reports a second series of 60 cases. The majority of cases chosen for treatment were unfavorable, and all had received, without apparent benefit, the best dietetic and therapeutic treatment which the Royal Edinburgh Asylum could give. There were several most gratifying results in the shape of recoveries where patients threatened to pass into confirmed dementia or had remained stuporous for long periods, as in 1 case of 2 years' standing. Whether or not its action is due to the febrile process induced by the thyroid and the subsequent reaction to the fever, the answer is made that the actual and visible result of thyroid-feeding has all the appearance of a condition induced by a toxin introduced into the blood through the medium of the mucous membrane of the stomach, and it undoubtedly produces a mild feverish condition, the action and reaction to which is often of considerable benefit to the patient. It is also a direct cerebral stimulant, and may prove

[1] Mercredi méd., 1895, No. 21, May 22; Boston M. and S. Jour., Jan. 25, 1896.
[2] Neurol. Centralbl., Dec., 1895.
[3] Brit. Med. Jour., May 2, 1896.
[4] Jour. Ment. Sci., 1895, No. 139; Am. Jour. of Med. Sci., Jan., 1896.

an advantageous treatment in cases whose higher cortical cells remain in an anergic condition after acute attacks of insanity. There is also strong probability that at some periods of life the administration of thyroid supplies some substance necessary to the bodily economy.

Reinhold[1] has used the thyroid treatment in 12 cases of insanity in which there was enlargement of the thyroid gland. Only cases of parenchymatous thyroiditis were thus treated, cystic goiters being excluded. The mental affection was always of a functional nature, and occurred nearly exclusively in young subjects. In every case the thyroid gland diminished in size. Thyroid tabloids were employed, and the treatment was continued in almost all the cases for 6 weeks. The average diminution in the circumference of the neck was $2\frac{1}{2}$ cm., the greatest decrease being 6 cm. and the smallest 1 cm. A loss of weight was noted in nearly all cases. It could not be said that the mental affection was at all influenced by the thyroid-feeding. The duration of the treatment does not constitute an objection to this view, because the specific action of thyroid-treatment occurs rapidly and soon attains its maximum; thus a further extension of the treatment is not indicated. In only 1 case has the author observed an increase in the thyroid after a discontinuance of the treatment. No unpleasant effects were noted. Thus the author's observations in relation to the diminution in the size of certain forms of goiter during thyroid-feeding accord with those of Bruns.

Babcock[2] gives a record of the results reached by him in the treatment of 13 cases in the St. Lawrence State Hospital for the Insane of New York. Two recovered—a case each of melancholia and mania; 7 improved, of whom 2 will probably recover—5 cases of melancholia and 2 of mania; 4 cases underwent no change—2 cases each of mania and melancholia, all of whom were undoubtedly demented to some extent when treatment was inaugurated.

"While the mental improvement, in suitable cases, dates from the first rise of temperature, the greatest improvement accompanies the gradual subsidence by lysis of the febrile reaction. As a general rule, the higher the temperature during treatment the greater the mental reaction following its fall, and the more marked the convalescence thereby established. When temperature subsides and continues normal for 48 hours, the thyroid should be stopped and general therapeutic measures substituted. Much harm may be done if treatment is prolonged beyond this stage. Hydrotherapy, static electricity, and massage will now be indicated in most cases and found useful to promote convalescence."

Wright[3] tried the remedy on a number of varied cases of mental disease, and reached the following conclusions: 1. That the drug produced a decided reaction in all the cases, as is shown by the feverish state and quickened pulse. 2. That the patients lost in weight and became quite feeble during its administration. 3. That the patients developed an increased desire for food, and gained in weight as soon as the drug was discontinued. 4. That the effect upon the

[1] Münch. med. Woch., Dec. 24, 1895; Brit. Med. Jour., Feb. 15, 1896, p. 28.

[2] Therap. Gaz., Apr. 15, 1896.

[3] Med. News, Apr. 4, 1896.

mental state is so slight as to hardly justify the period of time and inconvenience to patient of confinement to bed and the risk incurred by the administration of the drug.

Hedlicka [1] at the Middletown State Hospital of New York used thyroid in 4 cases of general paresis, 1 case of suicidal melancholia, 1 of primary dementia, 1 of dementia following acute melancholia, 1 of puerperal insanity, 1 of paranoia, and 3 of secondary dementia. All these patients were free from respiratory or circulatory disorder. The treatment extended over 2 months, and was begun with the administration of 5 gr. daily, and was gradually augmented to 25 or 30 gr. daily. Among the effects of the drug the following are recorded: Both the pulse and respiration increased in frequency, but this increase was never extensive. There was an increase in temperature of 1 or 2 degrees. The appetite improved. The bowels were regulated, and in several cases diarrhea was produced. The elimination of urea was increased. The majority of patients lost weight while under treatment. Regarding the mental symptoms, there was noted, under moderate dosage, pronounced general psychical improvement, the mind became clearer, more active, and the manner livelier. Sleep was improved. When the dose surpassed the moderate mark, as a rule symptoms of irritation appeared. While under treatment 1 of the cases developed a left brachial monoplegia without apparent cause, which disappeared without special treatment. The case of puerperal insanity was cured. The case of suicidal melancholia, that of dementia following melancholia, and 2 of the cases of secondary dementia were temporarily improved. The case of primary dementia grew worse. In the cases of general paresis but few temporary ameliorations were noticed. The author considers the remedy more as an alterative of great value than as a curative drug.

[1] Internat. Med. Mag., May, 1896.

ORTHOPEDIC SURGERY.

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of New York.

Introductory.—The range of orthopedic surgery is still not fully settled, and, while in America we include deformities of all kinds, deformities that relate to joints, whether congenital or acquired, the range is not so broad in England. We include everything that may legitimately be regarded, both by the Englishman and the American, as distinctly orthopedic. The president of the Orthopedic Association has attempted to define the scope, and due mention is made of his paper. A Text-Book on Orthopedic Surgery by Tubby is reviewed, and one finds little or nothing relating to diseases of the bones or joints. Another English writer has published a most excellent work on Tuberculous Diseases of Bones and Joints. The contributions to the deformity and diseases of the spine, while not very exhaustive, have been somewhat frequent, and it has been our aim to present an abstract of the more prominent articles. Some space has been devoted to the subject of shoulder-braces by reason of prominence given to this subject by a well-known surgeon. Compression-paraplegia and laminectomy are considered, but we regret to say that no great advance has been made in this department. What to do with cold abscesses still remains the subject of discussion between the strictly mechanical and the operative orthopedic surgeons. Much work that is satisfactory has been done by the pathologist, and it would appear that before many years have elapsed we shall know just what to do in a given case, how to manage a cold abscess, and what kind of prognosis one may give. There seems to be opportunity for much relief from dry heat, yet the literature is quite meager, and, while the details of treatment are full enough, the actual results cannot be obtained. We certainly hope for much improvement in partially ankylosed joints, especially those of a tuberculous nature, when all signs of the disease have disappeared.

In view of the number of papers on congenital dislocation of the hip much may be expected during the coming years, although it must be admitted that the various methods of treatment are likely to confuse one. For instance: Lorenz, who has operated more successfully than any other surgeon, has written a paper on bloodless reduction and retention. A brochure by Brodhurst is worthy of some attention, as he claims to have succeeded in not only reducing the dislocation, but in retaining the bone in the position in which he

placed it. He advocates a subcutaneous operation preceded by weight and pulley. The result of all this is that we find ourselves in a position of uncertainty. Very young children may be successfully treated by the bloodless method, while older ones and those yet under the age of 10 must be subjected to operation. Older patients still require bone-section, practically resection of the head of the femur. We have nothing new to offer in the treatment of hip-disease, but the deformities which result therefrom have received due consideration. Osteotomy, forcible correction under an anesthetic, are still the popular methods.

In club-foot the operation on the tibia for the persistent inward rotation seems worthy of commendation, and the work of Swan has placed the operation upon a substantial basis. It will be encouraging to the general practitioner to be assured by statistical evidence that many rachitic deformities are corrected without the use of apparatus or operation—in other words, that time and growth are important agents in correcting deformity.

The advances in Orthopedic Surgery during the past year have been much greater, in our judgment, than during the preceding year. It was difficult to find in the literature of 1894–95 much that was at all new, and there were, indeed, few papers that were of much interest. In the following review we have endeavored to give, as succinctly as possible, the work which has appeared on—1. Orthopedic surgery in general; 2. Bone-pathology; 3. The diseases and deformities of the spine; 4. On the hip, both in its diseased condition and in its deformities resulting from disease and occurring at birth; 5. On the management of abscesses, chiefly those which result from diseased areas which cannot be reached well by the knife; 6. On the knee and its deformities and diseases; 7. Club-foot; 8. Deformities of the hand; 9. Deformities occurring in rickets; 10. The affections involving the muscles and tendons. A number of papers have appeared on torticollis, but we failed to find any new features in these papers.

A Definition of the Scope of Orthopedic Surgery.—Whitman[1] suggests the following definition: "Orthopedic surgery is that division of surgery which treats of disabilities and diseases of the locomotive apparatus, and of the prevention and treatment of deformities of the framework of the body." [This definition covers very fully the scope of the specialty in this country. It is to be regretted that a uniform definition cannot be adopted for America and Europe. In England the diseases of the locomotive apparatus are not included, but the deformities which result from disease are often considered by writers who somehow avoid any reference to the underlying causes of deformity. For instance, diseases of the hip and knee—indeed, of all the joints—are studiously avoided and are left to the general surgeon. It is unnecessary, however, to contend with our English brethren so long as we are unable to unite upon the scope among ourselves. The Orthopedic Association is intended to include in its membership men who employ apparatus alone, men who confine themselves almost exclusively to operative work, and

[1] N. Y. Med. Jour., June 20, 1896.

those who resort both to apparatus and to operative procedures. It is safe to say that the last-named class of men are in the majority.] Whitman very properly deals with the subject from the standpoint of both the mechanician and the surgeon, and has included, therefore, in his definition, the work which is accomplished both by apparatus and the knife. He dwells especially upon "the prevention of deformity in its broader sense, by guarding the body during the growing period from the evil effects of carelessness and ignorance, as well as unnecessary compensation for local deformity and disability."

Deformities.—Tubby[1] has a volume of 598 pages, illustrated by 15 plates and 302 figures, of which 200 are original. It is divided into 5 sections—the first treating of deformities of the spine; the second, of neck, chest, and upper extremities; the third, rachitis and the resulting deformities; fourth, deformities of the lower extremity; and fifth, ankylosis, congenital displacements, deformities resulting from cerebral and spinal paralysis, arthrodesis. The book is well written, the type is large, and the illustrations are very fair. It has much to commend it. For instance, the chapter on caries of the spine or angular deformity, while original enough, is still in thorough accord with the best teachings that relate to abscess and to compression-paraplegia. He does not use the term myelitis, because not only his experience, but his reading, has taught him that in certain cases there may be no myelitis whatever, but in every instance there is compression. He dwells very fully upon the diagnosis, and insists, not unreasonably, upon the necessity for a careful and thorough examination, with an intimate knowledge of the meaning of pains, shuffling of gait, and irregular movements. From malignant disease of the spine he differentiates with special emphasis, and quotes extensively from Marsh, who has contributed largely to both malignant disease and tubercular disease of the spine. [The treatment does not seem to be quite up to date. There are figured a number of braces that have long since been set aside as useless, and his instructions for applying the plaster-of-Paris bandage are those which were given a decade ago. On the contrary, we can heartily commend his remarks on laminectomy.] Three chapters are devoted to the subject of lateral curvature, in no one of which do we find any new points bearing upon the treatment. Indeed, all the methods are described, but the author does not commit himself to any one method, and in this, perhaps, he is wise. He, for instance, urges the restoration of the general health, recumbency in certain cases, postural methods, exercise, and supports. The chapters on both congenital deformities of the hands and fingers and on acquired deformities are unusually good; 151 pages are devoted to club-foot, and the pages are illustrated by cases in all stages of deformity. The methods of treatment are fully in accord with the teachings of the present day, and the subject itself is very fully considered. [Altogether, the author has presented a work which would be hard to duplicate. The charge cannot be brought against him that he has not made himself conversant with the current literature, and especially the current literature of this country.]

[1] Deformities: A Treatise on Orthopedic Surgery, London and New York, 1896.

Surgical Diseases of Children.—D'Arcy Power[1] has presented a very practical book, in which there is much space given to deformities and diseases of the joints; 95 pages are devoted to tuberculous diseases of the bones and joints. The work contains 60 illustrations, many of which present the deformities as well as the apparatus for correcting the same.

THE SPINE.

A New Form of Shoulder-brace.—Keetley[2] presents a very simple, and to all appearances a very efficient, shoulder-brace, shown in Figure 143. To a plaster-of-Paris or poroplastic felt corset anterior crutches are attached by a free joint a little posterior to the axillary line, midway between the axilla and the iliac crest. These crutches move very freely on the joint, and make pressure against the anterior part of the shoulder, say over the distal end of the clavicles. The force is exerted through a rubber elastic, which passes from one to the other over the back. They do not make pressure at the middle of the clavicle, where most shoulder straps do, but just at the right point—a point where one would make pressure with one's fingers if an attempt were made to hold a patient straight. They do not, therefore, press upon muscles or interfere with the action of muscles so much as one would imagine. Indeed, Keetley's argument for the use of shoulder-braces in certain forms of round shoulders, dependent, for instance, upon lateral curvature, old Pott's disease of the spine, and simple weakness of muscles in children who are too young to exercise,—this argument, we say, is very fully elaborated, and is certainly worthy of attention. He claims, for instance, that in the round shoulders of lateral curvature the leverage-power is so great that a patient cannot hold himself up, the muscles act at a disadvantage, and a little support to the shoulders is a very valuable supplement to a brace. [The orthopedic surgeon of to-day rather discourages shoulder-braces, and for reason. The muscles can be so fully developed by gymnastic exercises that the practical man takes advantage of this, and endeavors to make shoulder-supports of the muscles themselves; but when it is impracticable to give a patient correct gymnastic exercises, and when, even if one does attempt it, the patient is not sufficiently docile, then resort must be had to some artificial support. For this reason we can commend Keetley's apparatus.]

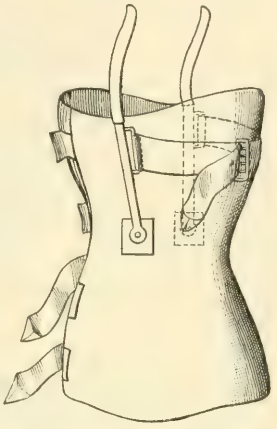


FIG. 143.—Shoulder-brace (Brit. Med. Jour., May 30, 1896).

A Spinal Brace.—Hoadley[3] describes a brace which takes its points of bearing over the sternum and over the pelvis anteriorly. No portion of the brace passes behind the body. Between the chest and the pelvic portion two lateral portions are so adjusted as to lie close to the sides, a little nearer the

[1] Surgical Diseases of Children, Philadelphia, 1895.

[2] Brit. Med. Jour., May 30, 1896.

[3] Jour. Am. Med. Assoc., Nov. 23, 1895.

posterior than the anterior aspects. The description of the brace is rather complex, although it seems simple enough, and one can get a better idea from the accompanying illustration (Fig. 144). [As to the merits of the apparatus we are not able to judge. It would seem to afford adequate support, though, like all braces, it is most efficient in the hands of the inventor.]

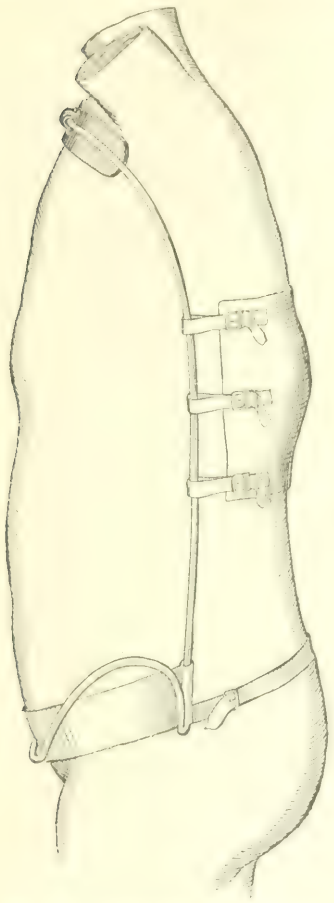


FIG. 144.—Spinal brace (Jour. Am. Med. Assoc., Nov. 23, 1895).

A Wagon with Apparatus for Pott's Disease.—Schapps[1] has published descriptions of an apparatus for the treatment of Pott's disease in the recumbent posture, which apparatus is attached to a kind of wagon. It is practically a combination of the Bradford-Cabbott frame with a wheel carriage, which enables the patient to be treated out of doors. [There is really nothing new in the device, but the details, which enable the physician to manage a case with the aid of an intelligent mother, are certainly an improvement on the ordinary methods of treatment by recumbency.]

Children's Spines.—Owen[2] contends for a close study of healthy as well as unhealthy spines in children. He insists on the necessity of giving the child the benefit of the doubt whenever one cannot tell whether the spine is normal or not. That is, the recumbent posture should be assumed until the diagnosis can be made clear. He deprecates the term "grow out" of some slight ache or discomfort. He thinks the term "growing pains" is very unfortunate. [His entire article is a plea, therefore, for early diagnosis, and this plea cannot be presented too frequently. His illustrations of the suppleness of a child's spine, the great flexibility, are especially good, and if the physician would always test the functions of the spine, errors in diagnosis would be much less frequent.]

Compression-myelitis.—Shands[3] presents brief histories of 22 cases, all of which give the final results, and all give, as well, the treatment employed, so that the statistician can easily make use of this material, and hence its mention in this article.

Cold Abscesses.—Gage[4] claims that if we can distinguish beforehand the abscesses which will disappear spontaneously and those that will not, the treatment is simple. An abscess that depends upon the tubercle-bacillus alone

[1] N. Y. Med. Jour., Aug. 1, 1896.
[2] Pediatrics, Mar. 1, 1896.
[3] Virginia Med. Monthly, 1895, p. 1165.
[4] Boston M. and S. Jour., vol. cxxxv. No. 2, p. 253.

will disappear either spontaneously or after one or more aspirations, while one that depends upon mixed infection, bacilli and other pyogenic cocci, will not, as a rule, undergo spontaneous resolution. Quoting from Dane, he says: "In pure tuberculous abscess, as in all purely tubercular lesions, leukocytosis is absent. If at any time the infection becomes mixed through the advent of pus-cocci, leukocytosis occurs. For instance, many cold abscesses of rib, hip, vertebra, etc. show no leukocytosis till opened; then the white cells rise." He concludes that if these observations are confirmed by further investigation, active interference should be postponed so long as leukocytosis is absent. He does not commit himself to the dictum, *no leukocytosis, no surgical interference*, yet we are sure that the trend of his article is in this direction. [His conclusions are fair, yet not fully in accord with the best surgical teaching of the day. To No. 4 of his conclusions we are sure the majority of orthopedic surgeons will subscribe.] The conclusions are as follows: "1. An abscess occurring in tubercular disease of the bones or joints is always secondary in importance, as well as in development, to the primary disease. Its treatment must not, therefore, in any way interfere with the treatment of the original lesion. 2. When the abscess is accompanied by any evidences of constitutional impairment, or interferes in any way by its location with the use of proper mechanical treatment, it should be immediately opened. When there is no interference with general health or with mechanical treatment, the abscess, if it presents a pure tubercular infection, may be left until it is nearly ready to open spontaneously. If it presents a mixed infection, it is to be opened at once. 3. All cases are to be opened as soon as they approach the surface to avoid unnecessarily extensive burrowing. 4. Of the methods commonly used in opening these abscesses—aspiration with irrigation, free incision with curetting—all seem to give inferior results to those obtained by simple incision in the most dependent portion, with the least possible interference with the walls of the abscess."

Shaffer[1] reports in detail 35 cases, 26 of which remained under the care of his hospital for a sufficient length of time to test the **value of** the plan of **noninterference.** Of the 26 patients, 3 had each 2 distinct abscesses, making 29 in all. In 2 of the double abscesses, large bilateral iliopsoas abscesses, absorption occurred. Of the 29, 27.58% underwent complete absorption; 65.50% opened spontaneously and closed under simple dressings in from 2 to 21 months; 6.89% were discharging a few drops daily at the time of his report; 93.09% have either closed or been absorbed. The remaining 9 are accounted for as follows: 1 was removed before treatment completed, 1 was nearly well when the patient entered the hospital, 7 had phthisis pulmonalis or multiple joint-disease or were removed from the hospital before treatment concluded. Of these 7, 5 died and 2 have small sinuses which discharge.

Wieland[2] reports on 21 **tuberculous abscesses,** with 16 complete cures treated by routine injection of iodoform in sterilized oil or glycerol, a 10%

[1] N. Y. Med. Jour., Feb. 29, 1896.

[2] Deutsch. Zeit. f. Chir., xli. 4, 5.

solution; 4 of the 21 left the hospital before recovery was complete; 1 had a fistula which would not heal and 3 months later caused septic infection; 14 of the 21 were seen again after the lapse of 2 years or more; 8 were quite well, without any return of the local tuberculosis; 1 had suffered relapse, but was cured by incision and curettage; 1 had a long fistula, but ultimately got well; 4 died 1 or 2 years after leaving the hospital—1 of tubercular trouble, 3 of amyloid degeneration. He did not omit good hygiene or medical therapeutics. Abscesses in tubercular arthritis, accompanied with grave suppuration, were most rebellious to the iodoform injections. [The method is tedious, and by reason of the long duration subjects the patient to the dangers of iodoform-poisoning.] Four cases had symptoms of poisoning, 2 of which had attacks of acute nephritis.

Bradford[1] presented a case, with autopsy, showing an abscess in front of the spinal column which pressed upon the trachea just below the larynx. For its treatment he proposed an incision down upon the tip of the transverse process at the level of the rib, removal of the periosteum from the rib, and exsection of a piece of the rib, the finger to be introduced into the opening for the purpose of exploration. On account of the larger vessels he suggested making incision on the right side. This operation he had performed in the mid-dorsal region, succeeding in draining the abscess without difficulty.

Dane[2] has studied **the blood in cases of tuberculosis of the bones** and joints, and among his conclusions he claims that a low leukocyte-count indicates the presence of an abscess, while a high count shows the presence of a secondary infection with pyogenic organisms, and in cases where at the primary operation the pus has proved satisfactory there is an increase in the leukocyte-count when the wound becomes infected.

SPECIAL TREATMENT IN CHRONIC BONE-DISEASE AND JOINT-DISEASE.

Iodoform-glycerol in Tuberculous Osteomyelitis.—Sherman[3] gives a paper on recorded experience in 20 cases—15 of hip-disease, 2 of knee-joint, 2 of ankle-joint, and 1 of elbow-disease; 164 injections were made. Half were intraarticular, the other half intraosseous, the solution being a 10% of iodoform in glycerol. In no case did he get iodoform-poisoning, nor was the injection the cause of suppuration. The action of the injections was in most instances disappointing. In no case was the orthopedic treatment interrupted. Commenting on this paper, Park had made an extensive trial of this method, but had not seen much benefit. In 2 of his cases which came to excision the iodoform was found packed into the mass, acting as a foreign body. He made culture-experiments with the iodoform, and these experiments demonstrated that the germicidal power of iodoform was very feeble. Moore said that he too had met with nothing but disappointment, except in the treatment of psoas abscess. Here he thought he had seen some benefit.

[1] Am. Med.-Surg. Bull., June 13, 1896.

[2] Boston M. and S. Jour, vol. cxxxiv. Nos. 23 and 24.

[3] Ibid., vol. cxxxv. No. 11.

Taylor stated that the iodoform and glycerol had proved disappointing, but it was his impression that a solution of iodoform and ether was valuable in sinuses. Ridlon had treated about 30 cases by intraarticular injection, one-third showing improvement; another third were stationary, and the remaining third appeared to have been made worse. Phelps had employed the treatment with negative results.

Hydrochloric Acid in Bone-diseases.—Waterman[1] has reported on 8 cases of sinuses leading to necrosed bone treated by the local use of hydrochloric acid. The acid employed was in the concentrated form, employed twice a week, the number of minims depending upon the individual case and the amount of bone exposed. These cases occurred in the Hospital for the Ruptured and Crippled, and were under daily observation. His conclusions were as follows: 1. No evil effects have resulted from its use. 2. The use of the acid in its concentrated form is preferable. 3. When the area of necrosis is extensive operative methods are advised. 4. Its action is limited to the necrosed area, whereas curetting may remove both diseased and healthy bone. 5. By the disintegration of the dead bone the newly-formed tissue has a better opportunity for its more rapid development.

Dry Heat of High Temperature.—Wirt[2] describes an apparatus which he has employed for the treatment of diseased joints consisting of a copper drum, 12 in. long and 9 in. in diameter, fitted at each end with a wooden ring and a hood of thick rubber. The back of the knee is protected with cotton after it is enclosed in the apparatus, and it is applied to the outside by means of a Bunsen burner. The majority of his patients tolerated a temperature between 250° and 300° F., provided 3 holes were made in the drum to secure proper ventilation and keep the air dry. It is claimed for this treatment that immediate relief to pain ensues and the mobility of the joint is temporarily increased.

THE HIP.

Congenital Dislocation.—Whitman[3] calls attention to the cure one may expect from the **Hoffa-Lorenz operation.** It is not an immediate perfect result, or even, so far as one can judge, a remote perfect restoration of function. [This accords with our own experience, and leads us to say that if one does not expect absolutely perfect results the operation may be of great value.] Hoffa[4] has presented a specimen obtained from a 3-year-old child dying of diphtheria after complete recovery from his operation. The pelvis showed that a good joint had been formed. The new acetabulum, which was soft and spongy when he operated, was found covered with a complete layer of hyaline cartilage.

Bloodless Reduction.—Mikulicz[5] attaches little importance to any malformation of the head or acetabulum in very young patients, claiming

[1] N. Y. Med. Jour., Aug. 8, 1896.
[2] Boston Med. Jour., Sept. 10, 1896.
[3] Med. Rec., vol. l. No. 11, p. 361.
[4] Am. Med.-Surg. Bull., 1896, ix. p. 97.
[5] Arch. f. klin. Chir., Bd. xlix. H. 2.

that at this period the head fits well into the acetabulum. The acetabular changes and those in the head take place during growth. He and Shede believe that in patients who have not walked replacement and retention are quite possible. Even taking into account the difficulties of cure—(1) shortening and retraction of muscles; (2) shrunken condition of the capsule or narrow opening into the acetabulum; (3) difference in size between head and acetabulum; and (4) hypertrophy of ligamentum teres—the slow method of reduction in these young patients will overcome all these difficulties. The apparatus he employs consists of 2 boards, extending from the buttock to the foot of the bed, united above, and so arranged that the lower ends can be supported. The legs are fastened to these and are abducted by means of the lower ends. He makes provision also for rotation and extension. He thus secures extension, abduction, and outward rotation. His patients are not confined to the apparatus all the time, but he at first applies it for 10 or 12 hours at a time. In the intervals he employs a corset to make pressure over the trochanters. Five cases are cited, 3 of which were entirely cured in 12, 17, and 18 months. He claims that the head was in the acetabulum and that the gait was normal. Ages, 1, 3½, and 4 years respectively.

Reduction of Dislocations of the Hip.—Allis[1] has published a most valuable inquiry into the difficulties encountered in the reduction of dislocations. The brochure contains 171 pages, composed of reminiscences which deal with 2 or 3 very interesting cases wherein the most skilful surgeons failed: Part I. an introductory study, which deals with the anatomy, supplementary work, and a nomenclature; Part II., reduction of dislocations by manipulation, wherein the methods and obstacles are critically examined. His nomenclature is based upon the "firm conviction that all conceivable dislocations are primarily either inward or outward, and that from these primary positions the head may be secondarily shifted to any point about the socket within reach of the remnants of untorn capsule that join the shaft to the rim of the socket." He would denominate the primary inward as the thyroid, the primary outward as the dorsal. The thyroid he would subdivide into the low, middle, and high thyroid, and the dorsal into the low, middle, and high dorsal. He rejects the names "sciatic," "spinous," "interspinous." "As the head can closely approximate positions described by authors as 'subspinous,' 'interspinous,' or 'spinous' from either plane, if the names are to be retained I would suggest the prefix thyroid or dorso." [The methods of reduction are very clearly illustrated, and we make mention of this valuable work as a supplement to orthopedic surgery. The lesions about the hip are so varied and so complicated that it is necessary for one accomplished in this specialty to become familiar with all the lesions that can possibly arise in or about the hip.]

Treatment of Ankylosis.—Lorenz[2] adopts an open method, through an incision about 5 or 6 cm. in length in the long axis of the femur, begun at a point over the trochanter. The incision is carried through the gluteal mus-

[1] The Samuel D. Gross Prize Essay, Philadelphia, 1896. [2] Berl. Klinik, June, 1896.

cles, parallel with its fibers, in order to free everything between the head of the femur and the pelvitrochanteric line. A wide chisel is now inserted between the head of the bone and the pelvis, but the periosteum is not separated. While the chisel is still in position an assistant should over-adduct the thigh, so as to favor the passage of the chisel into the socket. He aims, therefore, to divide all the adhesions. The limb is brought by means of traction and manipulation into the corrected position, and retained by means of a plaster-of-Paris spica. Perineal straps are employed. At the end of 4 or 5 days the patient is allowed to get up and go about, using a cane. At the end of 5 or 6 weeks the plaster from the knee down is removed, and a short spica is allowed to remain for about 2 weeks longer. At the end of this time the limb seems to be as firmly ankylosed as at first, but after it becomes less sensitive one will perceive a certain amount of flexion and extension. The author forbids all attempts at passive motion, but active motion is encouraged. The surgeon should encourage this from day to day and put the patient through active movements, a little later assisting by passive movements. His after-treatment he terms the "gymnastic after-treatment." As illustration, the patient is to lie at first on his abdomen, and, with from 5 to 20 lb. weight over his hips, allow the limb to swing in the air. This is to gradually increase the flexion. The reverse for extension. Where there is perfect bony ankylosis he advises that an osteotomy should be done through the intertrochanteric line. If only the neck remains, chisel through this.

Rarity of Juxtaarticular Tubercular Ostitis.—Menard[1] believes that this is rare in the region of the hip, from a very large experience at the hospital at Berk, where he was able to find only 5 cases.

Atmospheric Pressure.—Querken[2] is unable to verify the theory of the Weber Brothers that atmospheric pressure keeps the bones of the hip-joint in contact. He has made a number of investigations bearing on this point, laying bare the large trochanter, severing the sources of the muscles at their attachment, and employing weights attached to the femur for the purpose of separating the head of the femur from the acetabulum. Traction of a light weight was not sufficient to draw the head of the femur out of the socket. He estimates the pressure of the synovial fluid in the hip-joint as from 4 to 10 mm. of mercury while the joint is in a state of rest. He endeavors to controvert by clinical facts Weber's theory, citing as illustration cases of infantile paralysis and nontraumatic dislocations of the hip.

The Best Osteotomy for Vicious Ankylosis.—LeDentu[3] prefers the cuneiform excision, because he believes that the shortening can be still further overcome by continual extension. [We disagree with the author from a personal experience, and believe that the oblique section is preferable.]

Models for Measuring the Deformity.—Judson[4] has an attractive paper describing certain models which he has employed for estimating the

[1] Rev. d'Orthop., Sept. 1, 1895, p. 326.
[2] Ibid., May, 1895, p. 223.
[3] Ibid., Mar. 1, 1895.
[4] Am. Med.-Surg. Bull., Feb. 22, 1896.

angle of deformity. The advantage of these models, which are made of cardboard and so constructed as to give lordosis and free movements at the hips, limited at any given point by an ordinary scarf retainer, is that they enable one to measure lateral deviation as well as flexion and extension. The author claims for them great help in the class-room.

A Hip-splint.—Vance [1] attaches to a leather fixation-splint a stem which passes below the foot, by means of which traction can be made. [The author claims excellent results from this method, and those who are familiar with his work readily assent, because he is an expert mechanician, gives much personal attention to his cases, and especially to the fit of the apparatus. Other surgeons have failed to get the same good results from the use of leather.]

THE KNEE.

Synovitis.—Hoffman [2] has obtained good results by the use of adhesive strips applied over the joint, but not completely encircling the limb. In looking up the history of the use of adhesive plaster he has found that Peter Hood, an English bonesetter, used the adhesive strips, such as are employed in the Cotterell dressing for sprained ankle, as early as 1848. [As one of the authors has given credit in former publications to Cotterell of London, he begs now to acknowledge his indebtedness to Hoffman for calling his attention to the reference to Hood's treatment. His son, Wharton Hood, in his book on bonesetting [3] quotes from his father's article on the treatment of sprained ankle, which was published in 1858, as follows: "This feeling made me resolve to adopt the following course of treatment—namely, to strap the whole of the foot and ankle over with adhesive plaster and then cover this with a bandage." . . . . "I put the plaster evenly over the foot and ankle and then applied a bandage moderately tight. I drew on my stocking, and, to my delight and surprise, I was at once able to walk across the room without any pain, and continued throughout the day as long as I did not twist the foot, but kept it perfectly straight and flat when I placed it on the ground." It may be mentioned that the patient himself was Peter Hood. Furthermore, that the result was excellent—that he sprained the same ankle 5 years later, strapped it after a day or two of antiphlogistic treatment, securing very promptly an excellent result, which continued up to the date of his publication, 5 years later.]

Excision as an Orthopedic Procedure.—Plimpton [4] analyzes 65 cases wherein excision was performed as an orthopedic measure. The gross pathologic appearances are illustrated. The average shortening in 57 cases was a little less than 1 in., the least shortening $\frac{1}{2}$ in., greatest shortening 3 in.; 1 patient died from too much ether, 1 died 3 months after the operation, sarcoma appearing in the knee. [The article really is published, so far as one can judge from reading it, to demonstrate the rapidity with which the operation can be done. For instance: "The average time of operation in the

[1] Med. News, Aug. 29, 1896. [2] Am. Med.-Surg. Bull., Oct. 1, 1895.
[3] Macmillan & Co., 1871, London and New York, p. 103. [4] Med. Rec., Jan. 25, 1896.

last half of this series will not exceed 14½ minutes, save in an exceptionally bad case." A criticism has been offered by members of the Orthopedic Section, as well as the Surgical Section of the Academy, that the operation cannot be done thoroughly in that length of time. Indeed, the wisdom of attempting it is questioned. The reason given by the author is a good one—namely, the patient is less apt to get overdosed with ether.]

Bony Ankylosis.—Marsh[1] states that his opinions have materially changed with regard to the cause of bony ankylosis; that is, he formerly believed that suppuration was the only cause. Suppuration is not necessarily followed by ankylosis; and, indeed, this condition occurs often independent of suppuration. It occurs in tuberculosis without pus, in Charcot's disease, after nerve-injury, in gout and rheumatism, in gonorrhea, occasionally after trauma. He has observed it in extreme cases of lateral curvature and in osteoarthritis. He states, furthermore, that he knows of no means by which bony ankylosis can be averted in osteoarthritis, and is quite sure that passive movements cannot prevent it. When bony ankylosis does occur, he advises excision or osteotomy.

Death after Forcible Straightening.—Ahrens,[2] from Bruns' clinic, reports a death due to fat-embolism of the lungs. The patient was 53 years of age. The ankylosis had existed for a long time, and attempts at gradual correction had failed. Two days after the operation for forcible straightening drowsiness came on, and death followed next day. The autopsy showed the fat-embolism in the lung, the ends of the bones in an advanced stage of osteoporosis, and 2 recent crushes. He referred to analogous cases reported by Halle and Marburg.

Brisement Forcé.—Townsend[3] reports in detail 11 cases of ankylosis in which *brisement forcé* was employed, in many instances repeatedly. The cases were all rheumatic. His results were as follows: 1 complete cure when the shoulder was involved, 1 partial, but in this case *brisement forcé* was only employed once. There were 9 failures. He further concludes that one must be sure that no active disease exists at the time of the operation, and that the intervals between the operation should be given to massage, electricity, douches, and other similar measures.

Slipping Patella.—Bradford[4] reports 7 interesting cases in which the patella had become dislocated. In none of his cases was there any noticeable lengthening of the ligamentum patellæ, mentioned by Shaffer. Lack of tonicity of the extensor cruris muscles, especially the lower fibers of the vastus internus, and a laxity probably of the internal lateral ligaments, seemed to be the causes in the cases reported. He discusses the mechanical means employed —massage and electricity and operative measures. The operative treatment is easy of execution and free from danger. The procedure which he prefers is taking a fold in the capsule, while the transplantation or shortening of the ligamentum patella will not be found necessary except in the severer cases.

[1] Brit. Med. Jour., Nov. 2, 1895, p. 1087.
[2] Beiträge f. klin. Chir., vol. xiv.
[3] Med. News, Feb. 1, 1896.
[4] Boston M. and S. Jour., Feb. 20, 1896.

General Pathology of Bone.—Spencer[1] deals fully with the comparative physiology and embryology of bone, the effect of alterations in the circulation of the blood through bone, on nerve-influence, on changes due to impairment of general nutrition, and the new formation of bone. Among his conclusions are the following: A full normal supply of blood favors normal bone-formation. An excessive arterial supply leads to decalcification and absorption. A diminished supply checks the normal rate of bone-formation, and "eccentric atrophy" is the result. An excessive supply of venous blood causes pathological bone-changes. The nerve-influence is regulatory in action. There are other important conclusions drawn from these lectures that are well worthy of study.

Acute Infectious Disease.—Park[2] deals with the deformity and malformations which result from acute infections. In this he states that "necrosis forms by all means the most common result of osteomyelitis. Inasmuch as this produces weakening of the bone, fracture, deformity, or curvature may result." Incidentally he mentions that Volkmann collected 32 cases in which epitheliomatous changes occurred in the site of old fistulous passages.

Tuberculous Disease of Bone and Joints.—Cheyne[3] has embodied in a volume of 361 pages a valuable treatise on pathology, symptoms, and treatment. The chapters on the synovial membrane and bone are of especial interest to the orthopedic surgeon, and are based upon the author's Astley Cooper's prize essay. Operative procedures are not recommended to the exclusion of mechanical appliances, yet as a matter of course the latter do not occupy a very important place in the volume. [To one whose attention is devoted almost exclusively to mechanical orthopedics this book is of especial value, as it deals with the life-history of the tubercle, the localities in which it may be frequently found, and the influence of various agents employed for its relief.]

Loose Bodies in Joints.—Barth[4] has studied histologically 24 specimens, all due to a chipping off of a portion of the joint-surface or to arthritis deformans. The osteochondrosis desiccans theory of König was not susceptible of proof by pathologic anatomy. A cartilage-body may be torn out by undue tension of the crucial ligament, and yet very slight joint-symptoms follow. Signs of foreign body appear later, after many months, or years even. Curiously enough, the experiments on animals showed that the cartilage thus broken off remains alive, while the bone dies. The observations are interesting, because one should be able to make accurate pathologic diagnoses, and with this knowledge secure union at or very near the point of detachment, or, failing in this, to remove through an incision the offending portion.

Bolton[5] has analyzed 72 cases. His paper is full of interest, inasmuch as the different structures of these bodies have been noted, the postmortem findings in a few cases are recorded, and final results are given. He has no hesi-

[1] Lancet, May 30, 1896.
[2] Med. Rec., Nov. 2, 1895.
[3] Edinburgh and London, Young J. Pentland, 1895.
[4] Münch. med. Woch., 1896, No. 24, p. 577.
[5] N. Y. Med. Jour., June 27, 1896.

tation in recommending, from his exhaustive study, removal of the body when there is much disability.

Arthritis Deformans.—Osler[1] has placed on record 2 or 3 cases occurring in children. In 1 advanced case, a child 7 years of age, death occurred from intercurrent nephritis. The autopsy showed extensive involvement of the cervical vertebræ. He regarded this complication as exceedingly rare. [From our own experience the involvement of the cervical vertebræ is not so rare, as a number of cases have been under observation during the past 15 or 20 years at the Hospital for the Ruptured and Crippled. Very few have been placed on record, for the reason that they were so rebellious to treatment].

Koplik[2] presented quite an elaborate history of a case in a child 7 years of age. A very good bibliography is attached to his paper. [Unfortunately, however, there is little in the way of treatment that is worthy of record.]

Bier's Treatment.—Meyer[3] has made a report on 2 or 3 cases of tubercular joint-disease treated by the method of Bier. The idea in this treatment is that chronic hyperemia might favor resolution in tuberculous lesions. Meyer has found it valuable even after operations, and is firmly convinced that it is an excellent thing for obstinate sinuses. He insists that the patient must remain under observation for a considerable time, so that an acute or cold abscess, if it develops, may be recognized and treated early. The bandage he applies in a slightly different place from time to time, that atrophy of the muscles may be avoided. In children it should be applied quite lightly at first, in order to gain confidence. The parents are instructed to leave the bandage on as long as possible, say a half hour or as long as it is tolerable. After its removal massage is to be employed; then the bandage again. Pretty soon it can remain on day and night, to be removed morning and evening only for massage. The part of the extremity below the affected joint should be surrounded by a snugly-applied flannel bandage. [The treatment of itself is certainly commendable, but the danger seems to be in the confidence one may place in it to the neglect of protection apparatus. We are prepared to welcome any treatment that will assist in the cure of obstinate sinuses, and if hyperemia will contribute to this, it is certainly worthy of consideration. From a limited experience in hospital with tubercular ankles we are convinced that hyperemia has done very little in the way of effecting relief.]

CLUB-FOOT.

Inward Rotation.—Swan[4] proposes a new operation for the cure of inward rotation of the entire limb after aggravated equinovarus. He makes a section of the tibia at the junction of the middle with the lower third, carefully dividing it transversely. The section must be complete. The fibula is left intact, while the two segments of the tibia are firmly grasped, the lower one being rotated outward. This procedure carries with it the foot and the

[1] Mont. Med. Jour., 1896, vol. xxiv. No. 10.
[2] Arch. of Ped., Mar., 1896.
[3] Am. Med.-Surg. Bull., Jan. 25, 1896.
[4] Dublin J. M. Sci., Oct., 1895.

fibula. He closes as follows: "In these days of rigid surgical cleanliness the patient after such an operation should suffer neither pain nor inconvenience, and in a short time will be running about with symmetrical and unfettered limbs. I have operated on many dozens of cases by this method, and in the great majority of cases of aggravated equinovarus I believe it will be found a satisfactory and necessary proceeding."

Ridlon[1] has a memoir which deals quite fully with the modern treatment of club-foot, which is well illustrated, and which shows the Ridlon operation, which is practically a modification of the Phelps method. [For one who cares to see all the different methods well illustrated, the appliances employed, etc., we would urge him to consult this paper.]

Sayre[2] contrasts the results of removal of the astragalus with forcible manipulation in the treatment of talipes varoequinus. His comparison is rather in favor of the forcible manipulation. Although the foot not operated upon except by manipulation was the better foot of the two, he still was dissatisfied with the result, and made a cuneiform osteotomy of the tibia and fibula above the ankle-joint. In conclusion, therefore, he advocates in proper cases the removal of a wedge of bone from the tibia and fibula in preference to tarsectomy.

The *x*-Ray.—Barwell[3] and Willard[4] have published various forms of talipes as depicted by the *x*-ray. They are not very clear, and do not give us any more information than an ordinary picture of a skeleton foot would give. In one of Barwell's, however (p. 235), a very good illustration of the distortion of the os calcis and the extreme arching of the midtarsal region is shown in a case of calcaneus.

PARALYTIC DEFORMITIES.

Goldthwait[5] has placed on record a very interesting series of cases where the operation of **tendon-transplantation** has been performed, and Samuel Milliken[6] has published a single case in which he claims priority. This has been disputed by Benjamin Parrish, whose contribution was on record long before the date of Milliken's operation. Indeed, the members of the Orthopedic Section of the Academy have a very distinct recollection of Parrish's case, presented a few years ago. Goldthwait concludes as follows: "The best results are to be looked for in the cases in which one group of muscles is paralyzed, leaving the antagonistic or accessory group unimpaired." Much of the deformity is due to the action of these muscles without the control of the other group; 4 cases are reported after at least 3 months since the operation. The first case, that of an adult, was operated upon over a year ago. In all there has been a marked improvement. In 3 cases the peroneus longus was attached to the tendo Achillis and the peroneus brevis to the flexor longus pollicis. In 2 cases the anterior tibial tendon was attached to the peroneus

[1] Physician and Surgeon, Feb., 1896.
[2] Am. Med.-Surg. Bull., Dec. 15, 1895.
[3] Lancet, July 18, 1896.
[4] Am. Med.-Surg. Bull., July 18, 1896.
[5] Boston M. and S. Jour., Jan. 9, 1896.
[6] Med. Rec., Oct. 26, 1895.

tertius. The tendons were attached by splitting one and drawing the other through this and suturing them with quilted sutures.

Arthrodesis.—Karewski[1] gives his results in the operation known as arthrodesis. The 3 pathologic conditions which he claims can be overcome by this operation are shortening of the extremity, contraction of the joint, and flail-foot. It is done as a last resort. He finds it more serviceable in the ankle-joint or tarsus, though he has done the operation twice in monoplegia of the arm. His test for the benefits that may be derived from the operation is a simple one—namely, to put the foot in plaster of Paris and see how the patient gets about with it. In 9 patients operated upon, 7 used crutches before the operation, while afterward all of them could walk by simply using a cane. He states that, as the interval from the time of operation increases, just so much better becomes their condition as regards walking. Greater success is met with in children than in adults. In 1 of his cases necrosis of the calcaneus occurred, due to circulatory disturbance, and a partial resection of the joint was necessary to save the foot. He has done the operation in some cases of hammer-toe. [From our own personal experience in this procedure we are convinced that it has a very useful field. It is possible to make a flail-foot, even if one does not secure perfect synostosis, much more useful. The great difficulty in getting the best results is that the operation is usually confined to the tibio-tarsal joint, while the mid-tarsal joints are free, and, as the strain is thrown upon the foot at this point, the bony adhesions are sometimes broken down at the tibio-tarsal.]

HAND AND FINGER.

Cleft-hand.—Dowd[2] has placed on record a case successfully treated by the use of periosteal flaps. He has a very good Röntgen picture which shows congenital fusion of the 4th and 5th metacarpal bones. The pictures of the hand before and after operation show conclusively the value of the operation (see Figs. 145, 146).

Clasp-knife Finger.—Buedinger[3] relates the case of a woman aged 68 who fell with the thumb of her outstretched right hand abducted. Soon thereafter violent pain occurred in the neighborhood of the metacarpophalangeal joint, without swelling. Marked crepitation on movement of the finger was noted. A few months later pain gave place to an impairment of the flexion and extension of the joint. She noticed that active extension of the flexed thumb had become impossible, but that when she threw the last joint back forcibly with the other hand, the obstruction to extension gave way with a sudden snap. He found slight rheumatoid changes in the joint. Flexion of the thumb was nearly perfect, but caused at the base of the first phalanx a hard, painless mass, above which the skin was freely movable, and which could be felt to disappear with a sudden extension of the joint. On incision he found the swelling to be that of the tendon sheath folded up like a concertina

[1] Berl. klin. Woch., Sept. 23, 1895.
[2] Ann. of Surg., Aug., 1896.
[3] Wien. klin. Woch., May 21, 1896.

during flexion, and it caught the tendon so tight that it could only be released by a smart tug. The fold of the sheath contributed to the temporary swelling. The sheath was divided and tucked over, when the mobility of the joint

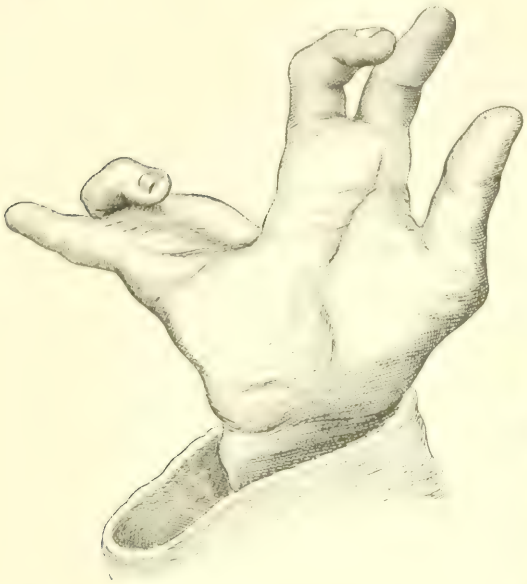


FIG. 145.—Cleft-hand treated by periosteal flaps: appearance before operation (Ann. of Surg., Aug., 1896).

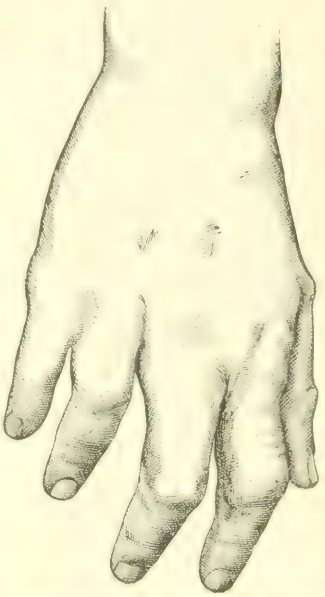


FIG. 146.—Cleft-hand treated by periosteal flaps: appearance after operation (Ann. of Surg., Aug., 1896).

was perfectly restored. In a study of this affection the author finds that the cause is by no means uniform, as it is often attributed to abnormalities in the tendon as well as in the sheath. He advises the open method by way of treatment.

MUSCLES AND TENDONS.

Marsh[1] gives a very interesting clinical lecture on the **displacements and injuries** of muscles and tendons. It is well illustrated, and deals pretty thoroughly with the displacements which one is apt to encounter. He does not commit himself to the open method of treatment, for the reason that in rupture of the tendo Achillis, for instance, union very often takes place if the severed ends are placed sufficiently close to each other. When a fleshy part of the muscle is torn he believes that attempts to unite the ends by suture would be useless, as the sutures would not hold; but when one can get the sheath of the muscle and bring the severed ends together, much good may result.

ACHILLODYNIA.

Roessler[2] presents a paper which is fully abstracted in the American Medico-Surgical Bulletin for March 28, 1896. The Achillo-bursitis anterior is the

[1] Brit. Med. Jour., July 25, 1896.

[2] Deutsch. Zeit. f. Chir., xlii. No. 5.

name the author gives, based upon an analysis of 10 cases. He shows by diagram the normal bursa in front of the tendo Achillis, and, having examined 225 of these bursæ, has seldom found them perfectly normal. In such as presented symptoms he found thickened walls, periosteal hypertrophy, with hyaline degeneration. Indeed, such changes existed as would occur from long-continued rubbing and irritation.

RACHITIC CURVES.

Spontaneous Cure.—Veit[1] had proved, by photographs taken in 1891 of a number of curves in rachitic children, and again in some patients 2 or 3 years later, that a spontaneous change for the better is the rule. [It all depends upon the growth. We can from our own general experience substantiate the claims of Veit.]

Bruns[2] has made similar observations at the Tübingen Clinic, and gives his conclusions as follows: 1. The greatest number of cases undergo spontaneous cure; 2. The process of spontaneous cure lasts from 2 to 4 years; 3. If the curves are unchanged at the sixth year, spontaneous cure does not occur; 4. The chief aim of the treatment is to improve the general health. Of the number of cases which he has observed, 75% were cured, 1.53% were improved, and only a little over 9% remained in statu quo. He believes that after the acute stage it is not detrimental for the children to be on their feet.

[1] Lagenb. Arch., Bd. i. S. 130.

[2] Beiträge chir., vol. xvi. 1.

OPHTHALMOLOGY.

BY

HOWARD FORDE HANSELL, M. D., AND WENDELL REBER, M. D.,

OF PHILADELPHIA. OF PHILADELPHIA.

General Epitome.—Although there has been no startling advance in ophthalmology during the past year, our lines of positive knowledge have been steadily pushed farther into the debatable territory. In **anatomy** we have come to know much more fully the intimate nature of the retina, thanks to the latest silver and gold methods of staining. One investigator traces accurately the light-impression, while another pronounces the sensation of sight as the result of a pressure-stimulus taking place within the goblet (pigment) cells. While speaking of the retina we might note the disposition on the part of some to class glioma of the retina among the sarcomata. **Trachoma** has come in for its usual full discussion, finding advocates for both the chemic and the mechanic treatment of the granules. Inasmuch as trachoma is a condition almost sure to terminate in a certain degree of conjunctival atrophy, it would seem that surgery ought to be reserved for the final "coup." **Sympathetic ophthalmia** has proved quite a battle-ground, and there is a growing consensus of opinion as to the inadequacy of Deutschman's migration-theory. Unfortunately, this relegates sympathetic ophthalmia to its position of 10 years ago. Attempts are again being made to trace the path of the irritation. As to **glaucoma,** the question remains in statu quo. The clinical fact seems to stand that, no matter what the exact nature of the originating cause may be, retention is the final expression of that process. The therapy of glaucoma is somewhat better defined by several exhaustive clinical studies.

Two corneal conditions have been extensively investigated: **ulcus corneæ serpens** and **keratitis interstitialis.** The former has been pretty conclusively traced to the pneumococcus or Fränkel-Weichselbaum bacillus, and the necessity for early vigorous measures is emphasized. **Parenchymatous keratitis,** it is claimed, is not so often evidence of hereditary syphilis as Hutchinson would have us believe. It is instead thought to be not infrequently tuberculous. The literature of **orbital tumors** has been quite enlarged, and we are glad to note an effort toward a better classification of orbital new-growths. The intractability of orbital syphilis is pointed out.

To perform **iridectomy** or not is still the question with cataract-operators. After sifting all the evidence we are more and more persuaded that

the preference for one or the other method is largely a matter of personal equation. The latest statistics would show that the average visual acuity is slightly better after the simple operation, yet it must be borne in mind that at times nothing deceives better than figures.

The eye in its relation to systemic diseases continues a fruitful field for the broad-minded investigator. One worker shows that the average duration of life after the appearance of albuminuric retinitis (save that of pregnancy) is 2 years. The widespread influence of gout on the eye is graphically set forth, and the almost invariable association of greatly lowered nutrition with idiopathic cataract reemphasized. Iritis is shown to be more frequently secondary to systemic conditions than is commonly believed.

The year has brought forth an avalanche of evidence to the effect that no department of preventive medicine is more important than the correction of **anomalies of refraction** and of muscular action. Doubt must give way before the brute force of such an array of facts. If permitted to continue in the child and youth, eye-strain means neurasthenia, etc. in the adult. The importance of the fact cannot, therefore, be overestimated. In all functional nervous diseases careful research into the condition of the intraocular and extraocular status, by a skilful oculist, cannot be too strongly advised. The pendulum is slowly but surely swinging away from the operative treatment of imbalance of the eye-muscles, the more rational gymnastic methods supplanting the surgical ones. The innervational method of increasing adductive power is rapidly gaining favor. The relative value of advancement and tenotomy as a combined measure in squint is graphically shown by an exhaustive study of over 600 cases.

Among **new remedies** formol seems to stand out as the most favored. Subconjunctival injections are not as popular as they were a year ago. Arecolin is added to our group of myotics, and iodol, ichthyol, rhinalgin, etc. have found a place in our therapy.

The most interesting **new instruments** of the year are a portable ophthalmometer and a prismatic perimeter.

The application of the **Röntgen rays** to ophthalmology in the detection of the precise site of foreign bodies in the anterior section of the ball has been practically demonstrated, and, in our opinion, it is only a question of a few months before their use will be extended to the diagnosis of foreign bodies in the vitreous. In fact, the practicability of this method has already been personally suggested to us. If a plate encased in a protective rubber shield is inserted far up into the nostril, and the Crookes' tube held close to the temple on the same side, it has been found that the blade of a Graefe knife that has been thrust through a fresh animal's eye imbedded in the human orbit, corresponding closely to the conditions obtaining in life, will be found pictured in its entire length after a few minutes' exposure, since the rays are transmittable through the thin plates of bone of the orbit and nose. By these means the presence, the approximate location, the shape, and size of a piece of metal can be positively determined before operation.

CONGENITAL MALFORMATIONS.

Normal Growth of the Eyes.—Weiss[1] measured accurately the eyes of new-born children and of adults at different ages, and found that the volume of the eyes increases from 3 to 4 fold during lifetime, the volume of the whole body 21 fold. The eyes grow at the same rate as the brain, and equally in all directions.

The Cornea.—A child 3 days' old died of pneumonia. Teplyachine[2] examined the cornea and uveal tracts, and found both were infiltrated with gummatous cells throughout their depth, showing conclusively intrauterine disease of both eyes of syphilitic origin. A congenital dermoid cyst was removed from the cornea by Brose.[3] There was also lack of development of the right side of the face.

Stephenson[4] has seen in the cases of 2 brothers **total absence of the iris** without other anomaly. Duboys[5] had a case of double congenital aniridia without other abnormalities.

Corectopia, according to Van Duyse,[6] originates in an abnormal formation of the vascular coat of the embryonic lens and in an incomplete absorption of the pupillary membrane.

The Lens.—Tiffany[7] observed 2 cases of ectopia lentis that occurred in a family of 9 children; 5 other children and the father had the same anomaly. All the children were hyperopic. Congenital aphakia, coloboma of the choroid near the disk, and an opaque body extending to the capsule from the disk coexisted in an eye examined by Dunn.[8] Piecola[9] reports a case of **persistence of the canal of Cloquet,** with remains of the hyaloid artery. The unusual coincidence of a **persistent hyaloid artery,** a persistent pupillary membrane, and a subconjunctival venous angioma is noted by Moll.[10]

Congenital night-blindness may exist without the ophthalmoscopic signs or the symptoms of retinitis pigmentosa. It is a distinct disease or condition depending upon the malnutrition of the deep layers of the retina. In the cases reported by Cutler[11] the disease was transmitted through the males only of 5 generations.

The Lids.—Congenital entropion of the upper lids was recorded by Harlan.[12]

The Orbit.—Lagrange[13] removed, with fatal result, a large congenital glioma of the orbit from a child 20 days old. Gallenga[14] has discovered congenital nodules of cartilage in the orbital tissue. In exploring the site of a dermoid tumor of the orbit that he had emptied of its contents Doyne[15] found the outer wall of the orbit was missing.

[1] Arch. of Ophth., Oct., 1895.
[2] Arch. d'Ophtal., Aug., 1895.
[3] Arch. of Ophth., Oct., 1895.
[4] Ann. d'Oculist., Nov. 14, 1895.
[5] La Clin. Ophtal., Apr., 1896.
[6] Arch. d'Ophtal., Dec., 1895.
[7] Jour. Am. Med. Assoc., xxv. p. 796.
[8] Arch. of Ophth., Jan., 1896.
[9] Ann. d'Oculist., Sept., 1895.
[10] Centralbl. f. prakt. Augenh., Mar., 1896.
[11] Arch. of Ophth., July, 1895.
[12] Trans. Am. Ophth. Soc., 1895.
[13] Arch. d'Ophtal., Sept., 1895.
[14] Ann. di Ottal., Anno ii. vol. ii. fasc. 9, 10.
[15] Ophth. Rev., Apr., 1896.

Nystagmus.—Adenoud[1] and Benton-Fanning[2] record instances of horizontal nystagmus associated with arhythmic horizontal oscillation of the head that ceased during sleep and diminished by will. Treatment was of no avail. The family history of the affection extended through several generations.

Hydrophthalmus.—Angelucci[3] believes that hydrophthalmus is a consequence of heart-disease, and should be classified as a vasomotor disturbance. Lodato[4] has made clinical observations to prove the uselessness of iridectomy in the treatment of congenital hydrophthalmus.

Lacrimal Apparatus.—Stephenson[5] reports the single instance in literature of a congenital duplication of the caruncula lacrimalis.

AMETROPIA, ITS CORRECTION, SEQUELS, ETC.

Size of Test-letters.—Grove[6] draws attention to the important fact that there is a difference in the size of Snellen's test-types as sold by different opticians. He has frequently measured them in private offices and in hospitals, and found them usually wrong. His observation is that the types are too large, and that this is the fault of the printer, but it will produce errors too great to be ignored in practice. [This is a matter that should be attended to. But the fault lies not wholly with opticians. Oculists are constantly authorizing the publication of test-cards regardless of Snellen's sizes.]

Beaumont[7] urges more definite regulations with regard to the question of **latent hyperopia** in the examination of candidates for public service. He points out the fallacy of assuming that vision of $\frac{6}{6}$ necessarily indicates emmetropia. [The same observation applies to the United States military and marine service. It should not be forgotten that statistics are valueless in which the tests have not been made under mydriasis and with the test-lenses. This also applies to the testing of the eyes of school-children.]

Ingalls[8] pleads for **the early correction of ametropia,** declaring that "it is a waste of time to send a child to school when his eyes are not in proper condition to do the work assigned." [This language is not one whit too strong. We have often felt the profoundest pity for children who, handicapped by an ocular defect, have been goaded by teacher, schoolmates, and parents into nervous collapse.]

Reflex Symptoms.—Jessup[9] reiterates the well-known fact that persistent and recurring headaches in young persons and in those near the presbyopic age are in many cases due to an error of refraction, weak accommodation, and anomalies of the extrinsic muscles. Mittendorf[10] reports 4000 cases of headache that were relieved by the correction of optical defects. In 50% of the cases the ametropia consisted of very low degrees of hyperopic astigmatism. Simple myopia[11] rarely plays an important role in the etiology, but

[1] Ann. d'Oculist., June, 1895.
[2] Lancet, Dec. 14, 1895.
[3] Ann. d'Oculist., June, 1895.
[4] Abst. Rec. d'Ophtal., Jan., 1896.
[5] Ophth. Rev., Jan., 1896.
[6] N. Y. Med. Jour., Apr. 14, 1895.
[7] Brit. Med. Jour., Oct. 19, 1895.
[8] Brooklyn Med. Jour., Sept., 1895.
[9] Practitioner, July, 1895.
[10] Trans. Am. Ophth. Soc., 1895.
[11] Jessup, loc. cit.

myopic astigmatism is often a cause. The troubles of accommodation are presbyopia, spasm, paresis, and paralysis of the ciliary muscle. The last two may follow influenza, typhoid fever, lactation, anemia, diphtheria, or other exhausting disease. The extrinsic muscle-anomalies are usually a loss of convergence. The eyes in all cases of headaches should be carefully examined under mydriasis in persons under 40 years, especially with a view of discovering astigmatism, and the error corrected. [In most cases the limit should be extended up to nearly 50 years of age.]

Of 270 neurasthenic women who had consulted Jones[1] for affections of their pelvic organs, 53 complained of head-symptoms. A large proportion of these suffered from varying degrees of hyperopic astigmatism; 27 were completely cured or greatly relieved by correction of their refractive error.

Gradle[2] maintains that other circumstances besides the optic condition must be taken into consideration in order to account for the variability of the subjective complaints. He refers to "normal asthenopia," where there is an appreciable ratio between the refractive error and the ocular disorder; and to "exaggerated asthenopia," where the relation between cause and effect is out of all proportion. The latter class will generally require the cooperation of the neurologist or general physician.

In young patients suffering from "eye-strain,"[3] who read little, are disinclined to study, are incapable of continued near-work, who wander from one oculist to another, and who have no palpable excuse for asthenopia, the cause will not infrequently be found in **irritation of the genital organs,** and particularly in these days of bicycle-riding, when from a badly-fitting saddle or too continuous riding vulvovaginal or prostatic irritation may be induced and unsuspected.

Coover[4] details 15 cases of **reflex irritation following eye-strain.** Among the prominent symptoms, all relieved by full correction, are attacks of convulsions resembling epilepsy, caused by continued use of the eyes at the near-point. Headache, vertigo, nausea, constant pain over the brows and occiput, restlessness, melancholia, loss of appetite, faintness, insomnia, palpitation of the heart, chorea, stammering, cough without expectoration, irritability, thickness of speech and numbness of the hand and tongue, mental confusion, backache, dyspepsia, are numbered among the symptoms. Halberstadt[5] adds to this list chronic constipation, dysmenorrhea, paresis of cervicospinal muscles, and temporary insanity. Elmer[6] recites examples of patients afflicted with epileptoid seizures, of mental condition approaching insanity, of chorea, and of petit mal, who were entirely relieved by correcting glasses. Lydson[7] also mentions epilepsy as a possible ocular reflex.

Kirkendall[8] cites a case of stammering in a child that disappeared after wearing 4 D. sphericals. He relates 2 cases of elderly persons in whom

[1] Brit. Med. Jour., Oct. 19, 1895.
[2] Med. Rec., Dec. 7, 1895.
[3] Editor Charlotte (Va.) Med. Jour., Apr., 1896.
[4] Med. News, Oct. 26, 1895.
[5] Lehigh Val. Med. Mag., June, 1896.
[6] Ann. of Ophth. and Otol., Apr., 1896.
[7] Chicago Med. Recorder, June, 1896.
[8] Am. Med.-Surg. Bull., Nov. 15, 1895.

nervous dyspepsia was entirely dissipated by the constant wearing of weak plus cylinders for astigmatism against the rule.

Methods of Diagnosis.—Bull [1] divides the visual range into 3 zones, the remote, the mean, and the near. Their extent depends upon the degree of ametropia. He says: "Make all astigmia myopic, and then measure the myopia in the remote zone. It dispenses with the necessity of resorting to the use of mydriatics for the purpose of subjective optometry." [We emphatically dissent. No method at present known can ignore the importance of mydriasis in either subjective or objective optometry.]

Retinoscopy is recognized as a useful adjunct to the list of objective tests of ametropia. Difference of opinion exists as to the source of the boundaries of the shadow. Thus, Weiland [2] demonstrates that the pupil of the observer's eye defines the outline. According to Jackson,[3] the factors that determine the form of the light-area and shadow in the pupil are the refraction, form, and size of the source of light, the form of the patient's pupil and of the sight-hole of the mirror. Bardelli [4] states that all phenomena of retinoscopy have their origin in the effects of light and shade as determined on the fundus by the pupil of the eye examined, while the pupil of the observer's eye does not enter as a factor. Bull [5] claims that the accurate and speedy way to determine proper correction in compound astigmatism is to ascertain and correct astigmatism *first*, and then the spherical defect.

The theory that **corneal astigmatism** is sometimes **corrected by** partial contraction of **the ciliary muscle** is combated by Hess,[6] who claims that previous workers have failed to take into account the play of the pupil and the influence of lid-pressure. In 23 persons, representing all the different refraction-conditions, he was not able to demonstrate in any instance partial contraction of the ciliary muscle. As **factors influencing the corneal curvature,** Lautenbach [7] considers not only the extraocular muscles and the lids, but also the orbital resistance, the ocular pressure, the tonicity of the cornea, and even the ciliary muscle, to be operative.

In a study of 2500 eyes the effort is made by Risley and Thorington [8] to show to what extent **abnormalities in the orbits** were associated with anomalous conditions in the bones of the face and nasal fossa. A number of patients presented a wide difference of refraction in the two eyes, with high astigmatism in one and much lower in the other, and with asymmetrical meridians; and this condition was associated with a well-marked difference in the two sides of the face. These differences suggest not only the probable etiology of the astigmatic eye and its asymmetries, but of many cases of absolute abnormality in the ocular balance, and define the limits of possible relief from treatment by surgical or other procedure.

[1] Ophth. Rev., Sept., 1895.
[2] Med. News, Oct. 12, 1895.
[3] Am. Jour. of Ophth., Apr., 1896, and Ann. of Ophth. and Otol., Apr., 1896.
[4] Arch. d'Ophtal., Apr., 1896.
[5] Ann. d'Oculist., Dec., 1895.
[6] Arch. f. Ophthal., 1896, part 2.
[7] Jour. Am. Med. Assoc., Nov. 23, 1895.
[8] Ibid., Nov. 16, 1895.

In an analysis of 1485 astigmatic eyes Kilburn[1] found a larger proportion had **axes against the rule** than other observers had noted, and especially in myopic astigmatism. [This result was due to the method of classification adopted. When the variation was less than 45° from the vertical he classed the case as according to the rule, and when less than 45° from the horizontal as against the rule.]

Davison-Schwarzchild[2] and Mittendorf[3] assert that astigmatism against the rule frequently develops about the presbyopic age in persons who have hitherto not had astigmatism or astigmatism according to the rule, because of alteration of the curve of the cornea produced by change of external muscular pressure which accompanies the phenomena of presbyopia. [It is by no means certain that the extrinsic muscles are concerned in the production of astigmatism in healthy eyes. Moreover, we have not noted that astigmatism against the rule is more common after 45 years than earlier in life.]

Green[4] has shown that when a **spherical lens is tilted forward** through an angle of 15° the maximum increase in the power of the lens is less than one-fourth of the maximum increase of power when the plane of the lens is vertical or when it is tilted forward through an angle of 30°. This principle is applicable to the correction of astigmatism the main meridians of which are vertical and horizontal by inclining spherical lenses without cylinders.

Starkey[5] reemphasizes the frequency and importance of **latent astigmatism.** According to his experience, all latent astigmatism may, in many cases, be made manifest without a mydriatic by giving lenses that correct the manifest error to be worn a day or two, when an additional amount of astigmatism will be manifest that may be corrected, and so on until all the latent trouble is unmasked. This is done without discomfort to the patient—a matter of no small advantage with the skeptical, the nervous, and the irritable. [This method is not without its good features, but it is not admissible in disturbance of the ocular muscles, in which case only the most careful correction under thorough cycloplegia can be accepted as the proper method.]

Prentice[6] in a paper entitled **"The Iris as Diaphragm and Photostat"** offers a theory for the beneficent action of low-power lenses (quarter diopters). Starting with the eyes as a compound lenticular system, he shows how, by preventing spherical aberration, the iris improves the definition of objects. This action on the part of the iris is in excess of that iridic act associated with accommodation. He believes that "a disturbed equilibrium of these functions is probably the cause of asthenopia in low degrees of ametropia." This would also account for the variation in symptoms in those presenting low degrees of ametropia, and would explain why some (those with small pupils) suffer comparatively little, while others (those with large pupils) are practically incapacitated for near-work. Asthenopia is therefore quite as likely to be experienced on account of the size of the pupil as it is on account of

[1] Boston M. and S. Jour., Feb. 20, 1896.
[2] Rec. d'Ophtal., Feb., 1896.
[3] Trans. Am. Ophth. Soc., 1895.
[4] Ibid.
[5] Jour. Am. Med. Assoc., Nov. 16, 1895.
[6] Ann. Ophth. and Otol., Oct., 1895.

refraction. The larger the pupil, the more pronounced will be the improvement in visual acuteness obtained by low-degree corrections. The quarter-diopter lens rarely proves of benefit when the pupils are small. Morrison's[1] studies lend color to the view that the pupillary conditions are well worth weighing in every case of refraction.

Mittendorf[2] affirms, unhesitatingly, his belief in **the value of the quarter-diopter cylinder,** and claims that in a certain proportion of cases even the eighth-diopter cylinder is appreciably beneficial.

The correction of high degrees of optical defect will, according to Dunn,[3] develop symptoms of muscular asthenopia that, with hitherto insufficient or absent corrections, have been latent. By clearly defining the images in each retina the struggle for binocular fixation is infinitely increased, and patients find it impossible to wear glasses that are properly fitted to the ametropia of each eye on account of muscular imbalance. [A point well made. We have seen frequent instances of such developed muscular asthenopia.]

Congenital predisposition to myopia is defined by Schnabel and Herrnheiser[4] as a defective development in either one or both of the ocular tunics in the immediate neighborhood of the optic nerve. They distinguish the sickle-shaped and the annular conus, the former occurring at the side, the latter within the sheath of the optic nerve. Hence all myopias are of the same anatomic origin, and there is but one form of typical myopia. They pronounce as false the view that the myopia of school-life originates in staphyloma posticum, and is likely to progress into malignant myopia, claiming that the development of posterior staphyloma cannot be arrested.

Greef[5] subdivides **high myopia** into the axial and the nonaxial. In the latter class, found most frequently in unilateral high myopia, posterior staphyloma is seldom found. He estimates the refractive value of the myopic lens at from 14–17 D., and contrasts this fact with the unvarying 10 D. equivalence of the emmetropic lens. Of the 3 ways in which the lens may produce myopia—namely, by forward displacement, by increase of its refractive coefficient, and by increase of its anterior and posterior curvature—he selects the last as the most probable factor.

Bitzos[6] concludes that in **the pathogeny of myopia** two factors are essential—elasticity of the sclerotic and an augmentation of the intraocular tension, existing simultaneously. Thus, Puech[7] describes a case of acute glaucoma in a young man who before had enjoyed good vision. After several attacks the eye became myopic, equal to 10 D., from overstretching of the sclera. All occupations or methods of life that contribute to diminish the resistance of the sclera, and those that necessitate increased exercise of accommodation, contribute to the development of myopia. Antonelli[8] demonstrated

[1] Ann. Ophth. and Otol., Jan., 1896.
[2] Loc. cit.
[3] Virginia Med. Monthly, July, 1895.
[4] Centralbl. f. prakt. Augenh., Sept., 1895, from Zeit. f. Heilk., Bd. xxi., 1895.
[5] Klin. Monatsb. f. Augenh., Oct., 1895.
[6] Ann. d'Oculist., Oct., 1895.
[7] Rec. d'Ophtal., Aug., 1895.
[8] Ibid., Sept., 1895.

the increase of refraction in the nucleus of the lens and the acquisition and growth of myopia in a case of iridochoroiditis by means of retinoscopy. [There may also be, in incipient cataract, an increase of refraction of the entire lens.] Roure[1] contends that the myopia so generally found with congenital opacities of the cornea and of the lens is due primarily to dilated pupil, necessary to even moderate acuity of vision, and secondarily to the higher and irregular refraction of the periphery of the lens and the accommodative effort necessary to focus the rays.

Field[2] considers that bright light in the school-room contributes to the increase of myopia among scholars.

Operation in Myopia.—Von Hippel[3] has operated on about 60 cases of high myopia in both young and elderly persons. The indications for the treatment do not rest upon the number of diopters of myopia, but upon the choroidal and retinal changes. One eye was lost by croupous conjunctivitis. Detachment of the retina was never observed after operation. Vision was increased from 4 to 10 fold. Sattler[4] has operated in 85 cases. Vision was increased from 3 to 4 fold only. Both operators declare that there is no nucleus in the lens of the myopic eye. Detachment of the retina followed in 4 of Sattler's cases. [This is no contraindication to operation, since detachment often occurs in nonoperated myopic eyes.] Fuchs[5] speaks of a case in which the myopia increased in spite of the extraction of the lens. Valude[6] is strongly in favor of the operation. Eperon[7] calls attention to 2 errors in the statements commonly found as to the effect of the removal of the lens in high myopia: 1. to consider that because in emmetropia a loss of refraction equal to 10 D. is found; 2. when it has caused a much greater loss of refraction to explain it on the assumption of the greater refraction of the myopic lens. The optical defect varies with each degree of primitive hyperopia or myopia, modified by the effect of the cut on the curvature of the cornea. The opinion that the lens plays an important role in the production of strong myopia, and that it possesses a refractive power superior to that of the emmetropic lens, is erroneous. The corneal curve should be measured in each case to determine its refractive power. [These calculations are based on the assumption that each 3 D. of myopia equals 1 mm. of axial length. While this is true of the lower grades, it becomes more and more incorrect the greater the length of the axis.] Stadfelt[8] believes, with Tscherning, that 16 D. represents both theoretically and practically the optical worth of the lens, for it must be remembered that in spectacles the correcting lens is 15 to 20 mm. in front of the position of the human lens.

Accommodation.—Greef,[9] Axenfeld,[10] Ovio,[11] and Zimmerman[12] are

[1] Ann. d'Oculist., June, 1895. [2] Jour. Am. Med. Assoc., Sept. 21, 1895.
[3] 24th Ophthal. Cong., Heidelberg, 1895; Arch. of Ophth., Oct., 1895. [4] Ibid.
[5] Ibid. [6] Abst. Rec. d'Ophtal., Feb., 1896. [7] Arch. d'Ophtal., Dec., 1895.
[8] Klin. Monatsb. f. Augenh., May, 1896. [9] Ibid., Sept., 1895.
[10] Ibid., Dec., 1895. [11] Abst. Oph. Rev., Feb., 1896.
[12] Arch. of Ophth., Jan., 1896.

agreed that as long as the path for the accommodative impulse is intact the impulse and act are the same in both eyes, whether there is or is not any interest in binocular vision. Seguin[1] asserts that the amplitude of accommodation is higher in those persons whose occupations demand constant use of the eyes at the near-point; the amplitude is less for each age than Donders' tables show.

Presbyopia.—Katz[2] compares thus the tables for presbyopia glasses:

Age.	Donders.	Landolt.	Katz.
40	0	.25	.75
45	1	1	1.5
50	2	1.5	2
55	3	2	2.5
60	4	2.5	3
65	4.5	2.75	3.25
70	4.5	3.3 (3.5)	3.5

[Pilgrim's[3] picture of asthenopia in presbyopia is not overdrawn. He justly ascribes the condition to the use, by the patient, of lenses of his own selection.] Pilgrim's method is to take careful account of the muscular balance after the presbyopia has been corrected. If abduction and adduction sustain normal relationship to each other, 0.37 D. is ordinarily deducted from the strength of the lens with which the patient declared the clearest vision at 14 in. was obtained. If, however, adduction was found to be below par, fully 0.62 D. is deducted, and 2 drops of a $\frac{2}{5}\%$ solution of pilocarpin is used in the eyes night and morning. If adduction is markedly reduced, prismatic gymnastic exercises after Gould's method are recommended, with the use of pilocarpin for a few weeks before glasses are prescribed at all. When defective abductive power is present, usually only 0.25 D. is deducted from the lens preferred by the patient. "In no case, however, should the full strength of the spherical lens selected by the presbyopic patient ever be prescribed."

Hansell[4] defends the use of **eye-glasses,** contending that from the cosmetic standpoint [which is no small one, considering the vast preponderance of women among ophthalmic patients] they are unquestionably to be preferred to spectacles; and arguing from the scientific standpoint they are not contra-indicated, inasmuch as properly-fitted glasses will support with precision cylinders, spherocylinders, and prismatic combinations.

Form of Lenses.—Thorington[5] advocates giving spectacle lenses a form that will approximately conform to the limits of the visual field. The resulting lens is ovoid in shape, the sharper end of the ovoid pointing nasally and slightly above the horizontal. As advantages he claims that it gives to the eye that lens which is consistent with the normal field of vision, and, secondly, the edge of the lens is sufficiently removed to be unnoticeable when the eye looks straight ahead. [There is so great an aversion to the use of glasses by the vast majority of those who apply to the oculist that it is only by the most

[1] Thesis of Bordeaux, 1895.
[2] Arch. d'Ophtal., Oct., 1895.
[3] The Refractionist, Mar., 1896.
[4] Phila. Polyclinic, Jan. 19, 1895.
[5] Am. Jour. of Ophth., Apr., 1896.

painstaking attention to the cosmetic effect that they can be persuaded to assume them at all; and while the perimetric lens is a beautiful and scientific idea, we fear that it will never be generally adopted.]

Cycloplegia and Cycloplegics.—Van Fleet[1] disapproves of the use of **atropia** in the determination of nearly all cases of refraction, on account of its uselessness and its dangers, believing that "modern methods" are sufficient without paralysis of accommodation to estimate the error. [Those who endeavor to do careful work will emphatically disagree with the author. His advice not to use it after 40 years of age, unless it is known that no predisposition to glaucoma exists, is sound.]

Murrell,[2] following Hobbs in the use of **scopolamin hydrobromate** as a cycloplegic, finds it satisfactory in refraction-work in $\frac{1}{10}\%$ strength, instilling 1 drop and in 15 minutes another. One hour after the instillation the ciliary muscle will, he claims, be paralyzed.

Morton[3] saw a case of **pseudoerysipelas following the instillation** of $\frac{1}{120}$ gr. **of atropin sulphate** in each eye.

THE ANOMALIES OF THE OCULAR MUSCLES.

Amblyopia without Squint.—[The theories of pathologic processes, such as rupture of the choroid or retina or other traumatism at birth, offered in explanation of amblyopia without squint in an otherwise normal eye, are inconsistent with recovery of vision in amblyopic eyes by means of exercise and cultivation through enforced use. Amblyopia from nonuse can only arise when *all* light is cut off. The amblyopia from squint is psychic, depending upon suppression of the visual image.] Segual[4] and Johnson[5] assume that amblyopia may be induced by the nonuse of the eye. [In Segual's case too many complications were present to warrant the acceptance of the conclusion. It is well known that operation will restore vision to many eyes that from long-standing cataract have been blind for years.]

Diplopia.—Alling,[6] after examining 56 pairs of normal eyes, assumes to disprove Duane's assumption of the frequency of paralysis of the superior rectus,[7] arguing that the diplopia seen at the periphery can be accounted for on physiologic grounds. Duane,[8] replying to Alling's article, reaffirms his former conclusion that diplopia in the periphery of the field of fixation is often due to paresis of the levators.

Three cases of **paralysis of the superior rectus** are reported by Bernstein,[9] who, in summing up, differs from Duane in supposing that they may arise from a lesion of the twig of the oculomotor supplying the superior rectus.

Sauvineau[10] suggests **a new type of paralysis** of horizontal movement of the eyes. A paralysis of the muscles moving the eyes in the same direc-

[1] N. Y. Med. Rec., Feb. 15, 1896.
[2] Ann. Ophth. and Otol., Oct., 1895.
[3] Ibid., Apr., 1896.
[4] Arch. d'Ophtal., July, 1895.
[5] Trans. Am. Ophth. Soc., 1895.
[6] Arch. of Ophth., July, 1895.
[7] Ibid., 1894, pts. 1 and 2.
[8] Ibid., Oct., 1895.
[9] Jour. Am. Med. Assoc., Nov. 9, 1895.
[10] Rec. d'Ophtal., June, 1895.

tion is not a paralysis of such and such muscles, but of certain functions of these muscles, while others are preserved. Foville, Fereal, and Graux describe two types of paralysis of lateral movement, and locate the lesion in the nucleus of the 6th pair.

Abnormal Associated Movements of the Eyelids.—Sinclair[1] says that in cases of ptosis or other paralysis of the ocular muscles movement in the direction of the paralyzed muscle may be effected by facial muscles, and classifies into groups, with explanatory hypotheses, the several associated movements. Hansell[2] reports a case of loss of conjugate divergence or paralysis of external rotation of the eyes in an ataxic young woman of 17. There was no diplopia or squint either manifest or latent. Conjugate deviation was absent. The disks showed no signs of neuritis or papillitis. [The ocular effect of ablation of part of the cerebellum is paralytic, but whether from direct influence of the cerebellum on the muscles or indirectly through loss of cerebral influence is uncertain.] Collins'[3] patient had sudden bilateral loss of convergence. The pupils acted normally, vision was good, the gait was unsteady, station bad, and knee-jerks exaggerated.

Double traumatism of the parietal region caused **paralysis of the external rectus and internal rectus of the right eye** in a patient of Rauge.[4] Bruner's[5] case of paralysis of the superior recti muscles was unique. There was intermittency of the relative strengths of the paretic muscles, although there was nothing to indicate spasm of the inferior oblique; 2° of esophoria were present. The author believes the paralysis was congenital in origin, and that the condition was due to a central deficiency rather than to malformation or arrested development of the muscles.

Functional Anomalies.—Gradle[6] describes asthenopia with insufficiency of convergence. He states that the converging power can be called insufficient only when the eyes cannot converge up to the normal limit in the absence of either paralysis or strabismic shortening of any of the eye-muscles. The measurement by means of prisms held base outward is not a direct test of the converging power; convergence under these circumstances is not a normal movement, but a muscular performance which can be increased by training. Its determination, therefore, does not give as definite a measure of the strength of convergence as the approximation-test. He expresses abduction and adduction in metric angles, and has found that 10 to 12 meter angles of positive convergence and 1 m. a. of negative convergence are the normal strengths. The relation of positive to negative convergence determines whether there is excessive action on the part of one set of muscles or deficient action on the part of the opposing ones. His cases showed muscle-balance at 20 ft., but at 15 in. there was pronounced exophoria. The most marked cases had from 4 to 5 m. a. of positive convergence, while the negative was normal. The degree of subjective annoyance did not correspond with the other neurotic

[1] Ophth. Rev., Oct., 1895.
[2] Med. News, Sept. 28, 1895.
[3] Ophth. Rev., Dec., 1895.
[4] Rec. d'Ophtal., Mar., 1896.
[5] Internat. Med. Mag., Oct, 1895.
[6] Jour. Am. Med. Assoc., Nov. 9, 1895.

symptoms. Moreover, under proper hygiene and moderation in the use of the eyes several patients gained considerably in comfort. Gradle inclines to the view that asthenopia, insufficient convergence, and defective accommodation, when found together, are associated manifestations of hysteria. Park[1] proposes the following general rules for the proper consideration of cases of insufficiency of the ocular muscles: All cases of muscular imbalance should be followed up for fully a year before the results are tabulated for publication. Muscular imbalance of from 5° to 15° occurring with hyperopia or hyperopic astigmatism will generally improve under correction of the refractive error, muscular exercises, outdoor life, tonic treatment, and sometimes the temporary use of prisms. The muscular insufficiencies found in myopia and myopic astigmatism require the use of prisms more constantly, and are not benefited as much by muscle-exercises as those occurring in hyperopia, etc. Tenotomies with advancements are generally more effective in myopic cases. Those insufficiencies occurring in constitutional, paralytic, and reflex cases require plenty of rest, outdoor exercising, the temporary use of prisms, electricity, and general tonic treatment. Hotz and Lydston[2] adduce strong evidence in favor of the causal relation of muscular imbalance to reflex headaches and other nervous disturbances. In asthenopia, persisting after the removal of all ascertainable causes, Starkey[3] recommends electricity. For weak extrinsic muscles the primary faradic current is used for its direct effect on those muscles. Asthenopes with almost normal extrinsic muscles should receive the galvanic or secondary faradic current. Oppenheimer[4] indorses the use of strychnin in insufficiency of the interni.

Amblyopia.—Connor[5] adheres to the belief that amblyopia in squint is not the cause, but the result, of axial deviation. All hypermetropes do not squint, because the normal relation between adduction and abduction (4 to 1) is changed by weakness of the interni to 2 to 1, or even 1 to 1. Further, some cases of decided amblyopia will secure full vision after tenotomy and the wearing of full ametropic corrections. [Connor's experience is singularly fortunate. We have never seen marked amblyopia ($\frac{20}{200}$ vision) permanently changed by operation.] Stevens[6] reports a case of hypermetropic **internal squint cured by tenotomy of the superior rectus.** He claims in this, as in numerous preceding articles, that lateral deviation depends upon abnormal vertical tension. [Stevens has offered no explanation for the obliquity of the cornea of hypermetropic squint. It is granted that simple internal squint, depending on hypermetropia, cannot exist. In monocular squint section of the superior rectus is necessary for binocular fixation, but for alternating squint division of each superior rectus, as practised by Stevens, is useless.] Boyer[7] urges painstaking investigation of the ocular conditions in all cases of **vertigo.** In many cases classified with incurable aural affections or tumors of the brain

[1] Jour. Am. Med. Assoc., Nov. 9, 1895.
[2] Chicago Med. Recorder, June, 1896.
[3] Jour. Am. Med. Assoc., Dec. 7, 1895.
[4] Trans. Am. Ophth. Soc., 1895.
[5] Jour. Am. Med. Assoc., June 29, 1895.
[6] Ann. d'Oculist., June, 1895.
[7] Ibid., Nov., 1895.

the vertigo will be found to be the result of imbalance of the eye-muscles, and it will frequently disappear when the equilibrium is restored. The author recites 10 cases in which this treatment was of the greatest benefit, in some instances immediate. He says that, while treatment of aural vertigo is habitually unavailing, the prognosis of ocular vertigo is particularly favorable.

The Operative Treatment of Heterophoria and Heterotropia.—By the use of an instrument which he calls the tropometer, designed to measure the power of rotation of an eye, Stevens[1] determines which muscle is at fault in heterotropia: "I would say that a case of strabismus convergens or divergens is to be studied from the standpoint of the tensions of all the eye-muscles, and that a very large proportion of these, and especially those of high degree, are the manifestations, principally, of vertical tensions." Theobald[2] thinks it may be safely affirmed that, other things being equal, the smaller an eyeball is, and perhaps the more deeply it is situated in the orbit, the less will be the effect of division of one of its muscles; the larger the ball and the more prominent its position, the greater will be the effect.

In cases of insufficiency of convergence Landolt[3] practises advancement of the internus, and, when this is insufficient, tenotomy of the externus. Before resorting to surgical measures he determines the value of rest, prism-exercise, and general tonic treatment; by means of the dynamometer the strength of the muscles, and by the perimeter the degree of excursion. In divergent paralysis advancement of the internus and extensive tenotomy of the externus have given good results. Advancement of a muscle or resection of a tendon as a substitute for, or practised in combination with, tenotomy (a method suggested by Landolt and practised by him for many years), is gaining adherents, among whom may be mentioned Thomas, Savage, and Hansell.[4] The last writer calls attention to the limitations of the usefulness of tenotomy.

Wood[5] and Campbell[6] approve of Savage's and Gould's methods of **prism-exercise** before resorting to tenotomy, both as a means of diagnosing which is the weaker muscle and as a means of treatment. Gould[7] has suggested an addition to our muscular nomenclature—namely, the "upper diplopsic point," corresponding to that degree of combined prism-strengths that first gives rise to diplopia; the "lower diplopsic point," corresponding to that degree of combined prism-strengths, when proceeding downward with the test, at which single vision is resumed; and the "diplopsic zone," or the range between the upper and lower point. Bergeois[8] is a partisan of **advancement.** Savage[9] prefers muscle-shortening in all cases of heterophoria when operation is proposed, regardless of the extent or direction of the turning. In doing advancement Thomas[10] tacks the advanced tendon down to the

[1] Ann. d'Oculist., July, 1895.
[2] Jour. Am. Med. Assoc., Nov. 2, 1895.
[3] Arch. d'Ophtal., Dec., 1895.
[4] Trans. Am. Med. Assoc., 1895.
[5] Jour. Am. Med. Assoc., Nov. 2, 1895.
[6] Physician and Surgeon, June, 1896.
[7] Ann. Ophth. and Otol., July, 1895.
[8] Rec. d'Ophtal., Aug., 1895.
[9] Jour. Am. Med. Assoc., Nov. 2, 1895.
[10] Ibid.

sclera. He remarks that "not more than 8° or 10° can be obtained by a partial section," and that "complete section of the muscle may result in 20° to 25° of effect." [The above estimate of the results of complete tenotomy is liberal indeed: the most experienced operators usually secure about 10°, while there are those who do not expect more than 5°.]

Panas[1] regards **incoordination of the centers,** without diminution of the strength of the muscles, as one of the factors in functional internal squint. The local cause is ametropia. Both internal muscles should be divided without delay if other means have not cured the squint by the eighth or ninth year. Hansell[2] sees in hyperopia the origin of the upward squint found so constantly in connection with the esotropia. He thinks it is due to the participation of the superior rectus and inferior oblique in the over-stimulus given to all the muscles supplied by the third nerve in their correlation to the overacting ciliary muscle. Therefore hypertropia in concomitant squint needs no surgical treatment: in constant squint tenotomy of the superior rectus is often necessary. In his estimation, hyperphoria seldom demands operation, notwithstanding the extraordinary claims made by enthusiasts. Partial or complete tenotomy is to be performed only when full correction fails. He looks upon exophoria as a passive condition that cannot be directly ascribed to an error of refraction. Advancement of the interni will often permanently cure.

Bull[3] in a statistical paper publishes data concerning 612 cases of **convergent squint** that had been followed for a time sufficiently long to permit a verdict as to the efficacy of tenotomy and advancement; 597 were hyperopes, 15 were emmetropes, and 18 myopes. In more than one-half of the cases the hyperopia was between 1 and 2 D. The results of tenotomy of the internal rectus of one eye performed in 164 cases were convergence in 62%, parallelism in 33%, divergence in 5%. Both interni were cut at the same sitting in 20 cases: result, convergence in 56%, parallelism in 5%, divergence in 30%. Tenotomy of both interni at different times was done in 186 cases: result, convergence in 79%, parallelism in 17%, divergence in 5%. Tenotomy of the internal rectus and advancement of the external rectus of the same (squinting) eye was done in 222 cases: result, convergence in 16%, parallelism in 80%, divergence in 2%. Tenotomy of the internal rectus of both eyes and advancement of the external rectus of the squinting eye was done in 14 cases: result, convergence in 21%, parallelism in 60%, divergence in 14%. Tenotomy of the internal recti, *and subsequent tenotomy of the internal rectus of the squinting eye*, was done in 6 cases: result, convergence in 50%, parallelism in 16%, divergence in 33%. Summing up the results, we find convergence remaining after operation in 50%, parallelism in 45%, and divergence in 5% of the cases. The improved vision after operation was not due to the operation, but to the beneficial effect of wearing full correction of the optical defect. [This statistical paper establishes what several workers

[1] Arch. d'Ophtal., Jan., 1896. [2] Jour. Am. Med. Assoc., Nov. 2, 1895.
[3] Trans. Am. Ophth. Soc., 1895.

have claimed for some time—namely, that combined tenotomy and advancement is the best method of correcting anatomic squint.]

Ophthalmoplegia.—Marina[1] makes a classic contribution to our knowledge of ocular palsies. His monograph embraces the following classes: congenital cases, bulbar paralysis, ophthalmoplegia externa, polyencephalomyelitis, sclerosis disseminata, syringomyelia, poisons and infectious diseases, polymyositis, polyneuritis, hysteria, cerebral hemorrhages, and other diseases.[2] Jack[3] had a child of 2 years under his care with suddenly-occurring paralysis of all the extrinsic muscles, probably of nuclear origin. There was no history of tuberculosis or syphilis on the side of either parent, and no other disease beyond a few enlarged glands. A history, similar in all respects, of a 1-year-old child is presented by Mary Putnam Jacobi.[4] Hubbell[5] studied nuclear ophthalmoplegia in a man aged 40, who noticed his trouble 28 years before. At the time of report the only extraocular movement remaining was a fair converging power. The iris was partially affected, while the ciliary muscle was entirely immune. The absence of trauma, specific infection, or other disease or diathesis rendered the origin of the affection obscure. Hubbell looks upon it as a "nuclear degeneration" in the fourth ventricle proceeding from before backward. The case of Ayres,[6] of ophthalmoplegia externa, with preservation of the intraocular functions, occurred in a strong healthy man 38 years old, whose history was entirely negative. Webster's[7] case was one of traumatic total ophthalmoplegia with consecutive optic atrophy. The lenticular ganglion was probably injured by a fracture at the base of the orbit.

Recurrent Ocular Palsies.—An instance of recurrent oculomotor paralysis that finally became permanent is recorded by DeSchweinitz.[8] Ormerod and Spicer[9] narrate 7 cases of recurrent paralysis of the different ocular nerves.

Syphilitic Paralyses.—Complete ophthalmoplegia, anesthesia of the cornea, atrophy of the optic nerve, and word-deafness on the left side, followed by similar but less pronounced symptoms on the right side, with death as the final issue, are reported by Dufour[10] as consecutive to gumma of the dura mater in the anterior part of the left middle fossa. There was a smaller gumma in the left olfactory convolution and a third one in the right optic commissure. Duclos[11] ascribes to syphilis a paralysis of the right oculomotor and left facial nerves, appearing within 2 months after the primary sore.

DISEASES OF THE LIDS.

Blepharospasm.—The cause of tonic blepharospasm is local or general.

[1] Ueber multiple Augenmuskel-Lähmungen, Wien, 1896.

[2] His treatment of the pupillary reaction and its relation to diseases of the brain will be found in the section on the Iris.

[3] Boston M. and S. Jour., July, 1895.

[4] N. Y. Med. Rec., Feb. 25, 1895.

[5] Buffalo Med. Jour., Aug., 1895.

[6] Am. Jour. of Ophth., Mar., 1895.

[7] Med. News, Feb. 29, 1896.

[8] Trans. Am. Ophth. Soc., 1895.

[9] Am. Jour. Ophth., Apr., 1896.

[10] Jour. Am. Med. Assoc., Jan. 18, 1896.

[11] Ann. d'Oculist., Feb. 1896.

Pershing's case[1] was attributed to prolonged tension of the nervous system. Of Chauvel's 7 cases,[2] 2 were congenital, 2 appeared in early infancy after convulsions, and in the others blepharospasm followed keratitis and traumatism. Treatment was of no avail in 5, and 2 were cured by section of the infraorbital nerve. Morton[3] was able to greatly improve a case of intractable reflex blepharospasm by stretching the orbicularis muscle.

Mubille[4] thinks blepharitis in children may be caused by the ringworm parasite, since it is often accompanied by patches of ringworm in the other parts of the body. He recommends touching the lid-margins with 2% sublimate, then alternate applications of iodin tincture and the following ointment: Sulphur, 10 gr.; salicylic acid, 6 gr.; vaseline, 5 dr. Dabney[5] cleans carefully the lid-margin, touches it with pure peroxid of hydrogen, and then with the ointment of the yellow oxid of mercury or a weak ointment of the oil of cade.

Chancre.—Simeon Snell[6] observed 9 cases of chancre of the conjunctiva



FIG. 147.—Keber's case of gummata of both upper eyelids (Am. Jour. of Ophth., May, 1896).

of the lids, 3 of which were in children, aged respectively 2, 4, and 11 years. Griffith[7] has seen each year 2 or 3 cases. Darlos[8] had a remarkable case in a

[1] Am. Med.-Surg. Bull., June 1, 1895.
[2] Rec. d'Ophtal., Oct., 1895.
[3] Ann. of Ophth. and Otol., Apr., 1896.
[4] Ind. Med. Mag., Aug., 1895.
[5] Am. Pract. and News, Mar. 9, 1895.
[6] Rec. d'Ophtal., Aug., 1895; Trans. Ophth. Soc. Unit. King., 1895.
[7] Ibid.
[8] Ibid.

girl of 10 years, whose mother communicated the syphilitic poison in an attempt to remove a foreign body from the conjunctiva. The entire free border of the lower lid was ulcerated and the eyelashes had fallen out. The preauricular ganglion was not involved [contrary to the statement given by Snell that this ganglion is always indurated], but there was an indolent large swelling of the submaxillary and cervical glands. The tonsils were ulcerated. Velhagen[1] also refers to a case of primary sore on the upper eyelid, Keber[2] puts on record an instance of gummata of the eyelids occurring in a man 40 years old (see Fig. 147).

Vaccine Pustule.—Vaccine matter was inoculated into an eyelid of a child by a scratch from another child that had been vaccinated, and whose fingers had been infected by scratching the sore. The cutaneous surface of both lids was converted into a confluent pustule.

Entropion.—Knapp,[3] DeSchweinitz,[4] and Silex[5] resort to transplantation of skin without a pedicle into the intermarginal space of the lid in severe cases of entropion and trichiasis.

Story's operation for entropion and trichiasis[6] was performed nearly 400 times in St. Mark's Ophthalmic Hospital with almost uniformly perfect results. The simple insertion of a piece of mucous membrane completely and permanently removes the cilia from contact with the cornea, does not shorten the eyelid, leaves the Meibomian glands intact, produces no cicatrix to rub the cornea, and leaves an eyelid less deformed than is left by any other method. Péchin[7] considers that in operations for the cure of cicatricial entropion the principal feature in bringing about a successful outcome is a V-shaped incision in the cartilage.

Tumors.—Transplantation of large pieces of skin with a pedicle after 2 operations for removal for the cure of epithelioma was successful in a case of H. Harlan.[8] Three years later the tumor had not returned. Oliver[9] records a good result 16 months after a similar operation.

Dermoid Cysts.—Chauval[10] describes 3 cases of cysts of the conjunctiva and lids. Achenbach[11] agrees with Hebra and Kaposi that horny growths of the lid take their origin from the rete mucosum. Davis[12] recites a case-history that is strongly suggestive of molluscum contagiosum of the lower lid in an infant.

Furuncles.—In the treatment of furuncles of the eyelid Lanvole and Gygax[13] recommend systematic bathing of the lid with salicylic acid 5, borax 3, distilled water 300 parts; or with precipitated sulphur 3, ammonium chlorid 1, rose-water 50, spirit of camphor 20 parts; or with spirit of camphor

[1] Klin. Monatsb. f. Augenh., Feb., 1896.
[2] Am. Jour. of Ophth., May, 1896.
[3] Jour. Am. Med. Assoc., Oct. 19, 1895.
[4] Am. Jour. Ophth., Feb., 1896.
[5] Klin. Monatsb. f. Augenh., Feb., 1896.
[6] Described first in the Ophthalmic Review, 1895, No. 4, p. 72, and Dec., 1895.
[7] Arch. d'Ophtal., May, 1896.
[8] Jour. Am. Med. Assoc., Oct. 19, 1895.
[9] Will's Hosp. Rep., vol. i., 1895.
[10] Rec. d'Ophtal., Nov., 1895.
[11] Centralbl. f. prak. Augenh., Oct., 1897.
[12] Ann. Ophth. and Otol., Jan., 1896.
[13] Therap. Woch., Nov. 24, 1895.

and precipitated sulphur, each 5, lime-water and rose-water, each 50, gum arabic 1 part.

Ptosis.—Bernhardt [1] cites a case of synchronous movements of a ptosic lid with certain movements of the inferior maxilla in a 9-year-old boy. The lid-movements were observed only when the mouth was opened widely during the act of chewing and with lateral movements of the lower jaw. Strangely enough, the lid was raised only when the jaw was moved from left to right, and was uninfluenced by opposite movements of the jaw. Tansley [2] operated successfully for congenital ptosis by a combination of the Panas and von

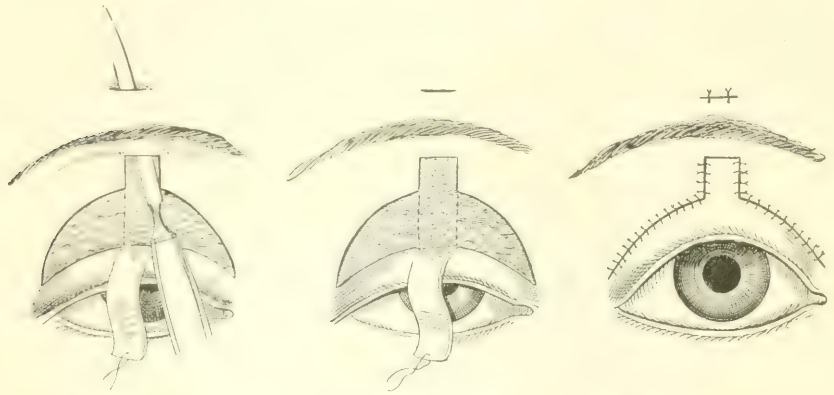


FIG. 148.—Operation for congenital ptosis (Trans. Am. Ophth. Soc., 1895).

Graefe methods (see Fig. 148). Evans [3] operates similarly, but uses silver wire as sutures.

Ectropion.—Hotz [4] approves of **Thiersch grafts** in ectropion and entropion. Augstein [5] considers **excision of the conjunctiva** a necessary part of every ectropion operation. Berger [6] relieved a severe ectropion of both lids, the result of an extensive burn of the face, by transplanting a large flap from the arm. The connection of the flap to the arm was divided on the twelfth day.

Infiltration-anesthesia.—Würdeman [7] in lid operations daily makes use of Schleich's infiltration-method, believing it to be of advantage for most operations in which the use of cocain is inadvisable.

DISEASES OF THE LACRIMAL APPARATUS.

The Tears.—Triboudeau [8] describes the secretion of tears to the influence of a branch of the seventh pair.

Bacteriology of Lacrimal Diseases.—Mazet [9] found in the pus of dacryocystitis the streptococcus, the bacterium coli commune, and the staphy-

[1] Centralbl. f. prakt. Augenh., Jan., 1896.
[2] Trans. Am. Ophth. Soc., 1895.
[3] N. Y. Med. Jour., Dec. 21, 1895.
[4] Jour. Am. Med. Assoc., Oct. 19, 1895.
[5] Centralbl. f. prakt. Augenh., Dec., 1895.
[6] Bull. de Acad. de Méd., June 6, 1896.
[7] Jour. Am. Med. Assoc., Nov. 16, 1895.
[8] Jour. de Méd. de Bordeaux, Nov. 3, 1895.
[9] Thesis of Paris, Apr. 5, 1895; Arch. d'Ophtal., Aug., 1895.

lococcus. In 10 cases of mucous dacryocystitis the pneumococcus of Friedländer was very abundant, and the cocci were found to be of great virulence. Fage[1] found a bacillus resembling that of Löffler, except that it is not virulent. Inoculation of cultures will produce purulent inflammation, but without false membranes. It is found in healthy conjunctiva, and requires underlying predisposition to disease to attain pathologic properties. Panas[2] reports a case of double purulent dacryoadenitis accompanying a severe attack of tonsillitis and mucopurulent nasal catarrh.

Puech[3] has seen 2 cases of **lacrimation caused by** the presence in the mouth of decayed **stumps of teeth,** through induction of the chronic inflammation of the antrum and the nasal fossa, thence extending upward into the nasal duct. Galezowski[4] saw persistent lacrimation caused by slowly-growing exostosis of the nasal canal.

Therapy of Lacrimal Diseases.—Duclos[5] recommends **fluorol,** in a strength of half part solution, in the treatment of dacryocystitis, as preferable to sublimate, to nitrate of silver, to the permanganate, etc., because the injections are not painful and are effective.

Thomalla[6] extols **rhinalgin** highly in acute and chronic dacryocystitis. Rhinalgin is prepared according to the following formula: Alumol, gr. $\frac{1}{6}$; ol. valerian, gtt. $\frac{3}{8}$; menthol, gr. $\frac{3}{8}$; cocoa butter, gr. 15. Make suppository No. 1. Use one morning and night in each nasal fossa. Bono and Marchetti[7] recommend the following injection into the lacrimal sac: Pure iodin, 50 c.g.; potassium iodid, 5 gr.; distilled water, 50 pts. Frohlich[8] prefers 10% solution of zinc chlorid as the application.

In the treatment of **lacrimal obstructions** Ramsay[9] urges the necessity of inspecting the nasal cavities and treating any inflammation or hypertrophy that may be present, and of learning whether the patient is a subject of syphilis, since cases intractable to probing are often cured by specific measures.

Diseases of the Lacrimal Gland.—Antonelli[10] reports a case of acute dacryoadenitis of the inferior lobe of the lacrimal gland.

Tumors of the Lacrimal Gland.—Extirpation of sarcoma of the lacrimal glands, traumatic in origin, was performed by Pfingst.[11] Scheffer[12] contributes a similar case. Piccoli's[13] case was one of carcinoma of the lacrimal sac in a woman 56 years old. After removal it recurred, and involved the adjoining bony structure, and caused death 3 or 4 months later. Lick's case[14] of tumor of the gland was microscopically diagnosed a granulation tumor of tubercular origin.

Dislocation.—An infant fell and ruptured the external orbital soft tis-

[1] Rec. d'Ophtal., Jan., 1896.
[2] Sem. méd., No. 5, 1895.
[3] Rec. d'Ophtal., Nov., 1895.
[4] Soc. d'Ophtal. de Paris, Rec. d'Ophtal., Feb., 1896.
[5] Rec. d'Ophtal., Nov., 1895.
[6] Centralbl. f. prakt. Augenh., Aug., 1895.
[7] Ann. di Ottal., Ann. ii. vol. ii. fasc. 5, 6.
[8] Klin. Monatsb. f. Augenh., Jan., 1896.
[9] Edinb. Med. Jour., Dec. 16, 1895.
[10] Ann. d'Oculist., June, 1895.
[11] Klin. Monatsb. f. Augenh., Aug., 1895.
[12] Thesis of Giessen, 1895.
[13] Ann. d'Oculist., Sept., 1895.
[14] Centralbl. f. prakt. Augenh., Apr., 1896.

sues, dislocating the lacrimal gland. Bistis[1] reduced the hernia and sutured the skin. The function of the organ was not disturbed. Von Graefe claimed that the only cause of expulsion of the gland was hemorrhage in the orbit. Galovine[2] restored by operation 2 dislocated lacrimal glands.

Lacrimal Obstruction.—Story[3] prefers the upper to the lower canaliculus preparatory to slitting the duct, because probes can be passed more easily with less twisting and turning, and because subsequent loss of function in the canaliculus is less injurious when occurring in the upper than in the lower canaliculus. Snell[4] advocates the use of the large probes suggested by Theobald, and Vulpius[5] has found that solid probes, equal in size to a Bowman No. 5, with a short horizontal shoulder, and worn permanently, the most satisfactory treatment.

Two more cases of **actinomycosis of the lacrimal sac** are fully considered by Schroeder.[6] In each instance the diagnosis was confirmed by the microscope.

Evetsky[7] confirms the claim made within the past year or two that some cases of apparent closure of the nasal duct, with all the symptoms of dacryocystitis, are really due to the presence of groups of actinomycosis. Division of the canal by Weber's knife and extraction of the yellowish masses will speedily cure.

DISEASES OF THE ORBIT.

Infection.—In empyema of the frontal sinus invading the orbit Snell[8] feels that it is better to operate early than to permit spontaneous opening of the abscess. A very unusual history of a bird-shot penetrating the frontal sinus, there to set up purulent inflammation which later invaded the orbit and induced suppurative orbital cellulitis, is narrated by Schwarzchild.[9] Surgical measures soon set things right. Fully as interesting was Cheney's case[10] of spontaneous perforation of the sclera, with partial evacuation of pus into the tissues of the orbit and possibly infection of the pancreas. The perforation was discovered only after enucleation. Villiard's[11] collection of cases illustrates the various causes of orbital diseases, such as phlebitis of the orbital veins, phlegmon of the orbit of tubercular origin, angina causing suppuration of the eye and death, angina causing suppurative choroiditis with recovery. Fryer[12] reports a case of aneurysm of some of the arteries in the orbit produced by a broken umbrella-rib, which had entered through the conjunctiva close to the inner canthus. Applying a stethoscope over the left common carotid, a bruit could be distinctly heard, likewise over the left temporal fossa, nearly synchronous with the wrist-pulse. A slight ocular pulse

[1] Ann. d'Oculist., Dec., 1895.
[2] Arch. d'Ophtal., Feb., 1896.
[3] Ophth. Rev., June, 1895.
[4] Ibid., xiv. No. 162.
[5] Arch. of Ophth., Apr., 1896.
[6] Klin. Monatsb. f. Augenh., Apr., 1896.
[7] Arch. d'Ophtal., Apr., 1896.
[8] Quart. Med. Jour., Sheffield, Oct., 1895.
[9] Am. Med.-Surg. Bull., Jan. 18, 1896.
[10] Boston M. and S. Jour., Aug. 8, 1895.
[11] Arch. d'Ophtal., Aug., 1895.
[12] Trans. Am. Ophth. Soc., 1895.

was observed. Mitvalsky [1] teaches that orbital thrombophlebitis, direct or indirect, consists of a purulent inflammation of the veins of the orbit, large and small, arising originally from thrombi whose presence is excited by the diplococcus of Fränkel-Weichselbaum, which exists in innumerable quantity, and of the staphylococcus pyogenes aureus. **Influenza** has to its credit this year 3 cases of orbital cellulitis; [2] 2 died of the general disease.

Diagnosis of Orbital Tumors.—Swanzy [3] lays stress on the following points in the diagnosis of the various neoplasms of the orbit: Exophthalmos or exorbitism; palpation; derangement of vision; pain; loss of motility; pulsation; and the consistence of the tumor. An additional diagnostic sign, according to Jocqs,[4] to which attention has not thus far been directed, is a souffle produced by the pressure of the ophthalmic artery on the branches of the dilated ophthalmic vein. Morton [5] reports a case of primary sarcoma of the orbit in a male 18 years old. An operation prolonged life for some months. Tetanus with fatal termination followed enucleation for sarcoma by Fernandez.[6] Bull [7] contributes a clinical study of several unique cases illustrating the following conditions: Abscess of the ethmoid cells invading the orbit; adenosarcoma and fibrosarcoma of the lacrimal gland; myxosarcoma of the sphenoid, ethmoid, and orbit; malignant tumor of the anterior cerebral fossæ and orbit; sarcoma of the dura mater and orbit; and cystoid angioma of the orbit. [Careful study of these case-histories will indicate what Swanzy pleads for above—namely, the necessity of painstaking differential diagnosis.]

Enophthalmos.—This subject, which has thus far 26 cases in its literature, is considered by DeSchweinitz,[8] who adds the history of a case. He believes that traumatic enophthalmos may be caused by paralysis of Müller's orbital muscle through some lesion of the sympathetic (Schapringer's theory).

Varieties of Pseudoplasm.—Under this heading Panas [9] treats of those orbital tumors reported as lymphoma, sarcoma, or syphiloma. The varieties are syphilitic, gonorrheal, exanthematous, influenzal, leukemic, uterine, and those following purulent ear-disease. Among remedies which may be useful are mercury, the iodids, arsenic, toxins, and the culture of streptococcus of Fehleisen (erysipelas). Kerchbaumer's case [10] could also be properly included in Panas's group. The patient was the subject of leukemia with lymphomatous deposits in both orbits, producing bilateral exophthalmos with low-grade optic neuritis on one side and choked disk on the other.

Ayres' [11] case of lymphangioma of the orbit occurred in a man 53 years old, who otherwise was perfectly healthy. The tumor filled almost the entire right orbit. Microscopically, it showed all the characteristics of lymphangioma cavernosum. Six months later there was no apparent disposition to recur. Knapp [12] removed a cavernous angioma from the depths of the orbit and pre-

[1] Arch. d'Ophtal., Jan., 1896.
[2] Herpergens, Ann. d'Oculist, Oct., 1895.
[3] Ext. Am. Jour. Ophth., Nov., 1895.
[4] Arch. d'Ophtal., July, 1895.
[5] N. Y. Med. Jour., Apr. 18, 1896.
[6] Rev. gén. d'Ophtal., Feb., 1896.
[7] N. Y. Med. Jour., Nov. 16, 1895.
[8] Trans. Am. Ophth. Soc., 1895.
[9] Arch. d'Ophtal., Sept., 1895.
[10] Arch. f. Ophth., pt. 3, 1895.
[11] Am. Jour. Ophth., Nov., 1895.
[12] Arch. of Ophth., Jan., 1896.

served the ball with useful function. A 3-year-old child, presenting 2 tumors at the right side of the head in the neighborhood of the occipitoparietal suture, also right exophthalmos, was seen by Rohmer.[1] The large tumor was the size of a walnut, fluctuating, and was reducible by pressure. When the right common carotid was compressed, a slight isochronous murmur could be heard, the eye returned entirely into the orbit, the cranial tumor diminished and ceased to pulsate, and the souffle was arrested. Rohmer believes the condition was due to a dilatation of the intracranial veins on the right side. Another case in a child of 7 was under the observation of Valude.[2] Exophthalmos had appeared some years before. Three exploratory operations, necessary on account of the recurrence of the exophthalmos, were unsuccessful. A fine needle connected with the negative pole of a galvanic battery was introduced into the bottom of the cavity and the positive pole applied to the jaw. Two applications of 3 or 4 ma. at an interval of a few days sufficed to entirely cure the exophthalmos.

Pulsating Exophthalmos.—A case of probable angioma cavernosum of the orbit is reported by Churchman.[3] At the time of operation there were great exophthalmos, swollen and closed lids, immobile globe, and internal ophthalmoplegia. Vision was $\frac{20}{50}$. The other eye and orbit were normal. Ligation of left common carotid was performed; 2 months later there was perfect motion of the upper lid and almost perfect motion of the ball itself. Vision with correcting glass was normal. Churchman was unable to find any cause whatever.

Dermoid Cysts of the Orbit.—In the case reported by Millikin[4] the cyst sprang from a spur of bone projecting from the roof of the orbit. A circlet of hairs, some of them an inch long, surrounded the spur. Millikin advises total excision when the cyst is small and the walls thick.

Osseous Tumors.—Coppez[5] in an osseous sarcoma of the orbit found the vessels altered and the muscles infiltrated by great numbers of small cells. Martin[6] cured a marked exophthalmos by removing a nasoorbital osteoma.

Endothelial Tumors.—These tumors arise, according to Van Duyse,[7] from the lining membrane of either the blood-vessels or the lymphatics, and are carcinomatous in their nature. Before operating we must determine that they have no connection with the brain.

Syphilitic Disease.—Mandelstamm[8] describes a bilateral syphilitic affection of the orbit. Rebellious at first to vigorous inunction, it yielded later to mercury subcutaneously, after the right eye had ruptured through the cornea. The functions of the left eye were almost completely restored. The final diagnosis was a localized syphilitic process in the orbit at the superior orbital fissure, the gateway of the principal ophthalmic veins and nerves.

[1] Rec. d'Ophtal., Sept., 1895.
[2] Ibid., Oct., 1895.
[3] Ann. Ophth. and Otol., Oct., 1895.
[4] Arch. of Ophth., July, 1895.
[5] Arch. d'Ophtal., Sept., 1895.
[6] Jour. de Méd. de Bordeaux, July, 1896.
[7] Bull. de l'Acad. de Méd. belgique, pt. ix., Mar., 1895; abst. Arch. d'Ophtal., Oct. and Nov., 1895.
[8] Centralbl. f. prak. Augenh., Oct., 1895.

In this way the author accounts for the terrific exophthalamos, conjunctival chemosis, and almost complete immobility of the globes. Blessig's case [1] was that of a man 31 years old, married and the father of healthy children. He admitted infection when 18 years of age. In April, 1894, the first ocular symptoms occurred in the right eye. The orbital nature of the affection soon declared itself, and the condition became so threatening by September that complete evacuation of the orbit was done, and a true gumma demonstrated under the microscope. A month elapsed before the affection appeared in the left orbit, and 6 weeks later the patient died. The gummatous process had passed backward through the right optic foramen and sphenoidal fissure into the middle fossæ of the cranium, involving finally the right temporal lobes of the brain. Blessig comments on the want of response to the most energetic antisyphilitic treatment in the case, and quotes Mracek's observation that gummatous processes within the orbit belong to the most obstinate of all syphilitic affections.

Foreign Bodies.—Two unusual cases of foreign bodies remaining in the orbit for 18 and 12 months respectively, without producing irritation, are reported by Hoene.[2]

DISEASES OF THE CONJUNCTIVA.

Conjunctivitis of the New-born.—In Stockholm, Sweden, the frequency of ophthalmia neonatorum between the years 1884 and 1890, inclusive, decreased from 1.2% to 0.25%. This good result Widmark [3] ascribes to preventive legislation and to the general diffusion among midwives of a knowledge of Credé's method of prophylaxis.

Treatment of Conjunctivitis of the New-born.—Hosch [4] disapproves of Credé's prophylaxis, because it induces conjunctivitis and does not prevent purulation. Abadie [5] agrees with him except in cases of gonorrheal infection.

Kalt [6] has used **the irrigation-method in** the treatment of 200 cases of **purulent ophthalmia.** He prefers the less irritating calcium permanganate to the potassium permanganate, 1 g. to 3 liters of water at 25° C., each eye receiving one-half. He orders 4 irrigations (3 with the permanganate and 1 with warm water) daily for the first 2 days, gradually reducing the frequency. Abadie [7] disapproves strongly of frequent washes of strong bichlorid solutions, on account of deep opacity and weakening of the structure of the cornea as a result of their use, especially if iodoform is added to the treatment. He relies upon boric acid and potassium permanganate.

Bardelli [8] speaks in the highest terms of **formol** as an antiseptic in purulent conjunctivitis and keratitis in the strength of 1 : 1500 as a wash.

Wallick [9] calls attention to the danger in unskilled hands of the early use

[1] Klin. Monastb. f. Augenh., Sept., 1895.
[2] Ibid., Feb., 1896.
[3] Centralbl. f. prakt. Augenh., Sept., 1895.
[4] Rep. Bâle Polyclinic, 1895.
[5] La Clin. Ophtal., Apr., 1896.
[6] Acad. de Méd., Oct. 29, 1895; Ann. d'Oculist., Nov., 1895.
[7] Loc. cit.
[8] Ref. Centralbl. f. prakt. Augenh., Apr., 1896.
[9] Rev. prat. d'Obstet. et de Pædiat., Paris, July, 1895.

of the nitrate of silver in purulent conjunctivitis of the new-born, and advocates the method of treatment by irrigation. Vacher[1] has used Kalt's method with satisfactory results. He recommends silver nitrate 1 : 1000, potassium permanganate 1 : 1000, 1 : 2000, 1 : 3000, 1 : 4000, mercuric cyanid 1 : 5000 and 1 : 10,000, and mercuric chlorid 1 : 3000, 1 : 10,000, 1 : 15,000. Sicherer[2] prefers the oxycyanid to the bichlorid, because it is less irritating and causes less precipitation of albumin. Frothington[3] often uses silver nitrate from 40 to 60 gr. solution, and says 10 gr. only shows no result; and Coleman[4] thinks 12% is the proper strength. Scott[5] recommends the following collyrium in the beginning of an attack: Hydrastis sulphate, boric acid, borax, each, 5 gr.; laudanum, ½ dr.; distilled water, 1 oz.

Reynolds[6] advises against the use of nitrate of silver in gonorrheal conjunctivitis, and urges the instillation of Jaenel's emulsion of copaiba, ℥ij; distilled water, ℥vj.

Catarrhal Conjunctivitis.—The bacteriologic study of acute conjunctivitis is placed on a definite basis by the investigations of Morax and Bach[7] by a classification of the different forms of bacteria and description of Week's bacillus. Microscopic examination of the discharge will establish the diagnosis and elucidate the causes of epidemics, distinguishing this form from that in which gonococci, pneumococci, streptococci, or Klebs bacilli may be found. The authors differ from the opinion of Weeks, that acute conjunctivitis is never complicated with lesions of the cornea, and give 6 cases in which superficial involvement of the cornea was present. In the treatment of acute, chronic, or granular conjunctivitis Anderson[8] applies 10% solution of antipyrin, and orders a 4% solution for use at home.

Diphtheric Conjunctivitis.—A case of diphtheric conjunctivitis in which true diphtheria-bacilli were found occurred during an attack of measles, and was complicated by corneal abscess, purulent cellulitis of the lids and cheek, and extension of the false membrane to the nose and throat, in a patient of Guttman.[9] Early in the disease 20 c.c. of antitoxin were injected, but had no influence whatever in staying the progress of disease or in averting the fatal ending. Coppez and Funk[10] speak from a large experience in the highest terms of the efficacy of serum-therapy in the treatment of diphtheric conjunctivitis. They say: "It is superfluous longer to insist on the important role played by serotherapy in the treatment of ocular diphtheria." Hamilton and Embryos-Jones[11] and Lagrange[12] write in favor of serum-injections.

In a study of **the pneumococcus in ocular pathology,** Guenod[13] states it has been found in conjunctivitis, in deep ulcers of the cornea, in

[1] Rec. d'Ophtal., June, 1895.
[2] Münch. med. Woch., Dec. 3, 1895.
[3] Harper Hosp. Bull., Aug. 17, 1895; ref. Therap. Gaz., Dec. 16, 1895.
[4] N. Am. Pract., Jan., 1896.
[5] Ibid.
[6] Jour. Am. Med. Assoc., Jan. 11, 1896.
[7] Arch. of Ophth., Jan., 1896.
[8] Therap. Gaz., 1895, No. 12, p. 863.
[9] Arch. of Ophth., Oct., 1895.
[10] Arch. d'Ophtal., Nov., 1895.
[11] Brit. Med. Jour., Dec. 7, 1895.
[12] Jour. de Méd. de Bordeaux, Mar. 31, 1896.
[13] Rec. d'Ophtal., June, 1895.

dacryocystitis, and in panophthalmitis. It is a normal resident of the upper anterior air-passages, and causes ocular trouble not only from external conjunctival infection, but by interior infection of the deeper membranes of the eye and the orbit.

Trachoma.—Malgat [1] admits the contagiousness of trachoma, but in a limited sense. Purulent conjunctivitis will, by contagion, reproduce itself only, while trachoma-poison may induce other forms of conjunctivitis. In the former there is no immunity, while in the latter immunity is practicable. The Celtic and negro races, the inhabitants of mountains, children under 12 years, and the nonscrofulous are immune. Van Millingen's [2] conclusions as to the etiology of trachoma—namely, that it is a contagious and infectious disease, not influenced by altitude, and that all races are equally susceptible—Burnett [3] considers are not justified by the facts.

Everbusch [4] and Crainicean [5] discountenance the mechanical treatment of trachoma. Everbusch lays great stress on canthoplasty. In intractable pannus peritomy has failed in his hands. He uses tincture of iodin, making a ring of iodin-spots around the cornea about 3 mm. from the limbus, taking care the spots do not coalesce nor encroach on the corneal tissue. Iodin in its pure state in 0.5, 2.3, or 5% solution in liquid vaselin is also advised by Nieznamoff.[6] Beard [7] applies mercuric bichlorid 1 : 60 or silver nitrate 60 gr. to the ounce, and irrigation by hot boric-acid solution. Geiger [8] pronounces expression of the granules with the thumb-nails and subsequent scrubbing of the conjunctiva with a piece of cotton soaked in mercuric bichlorid 1 : 2000 as decidedly the best method of treating trachoma mechanically. Jaesche [9] prefers expression to all other forms of treatment, though it is a significant fact that he invariably employs a 2% solution of silver nitrate in the after-treatment. Strouse [10] approves of scraping the follicles with a small nonfenestrated soft spoon or "curettage," and then applies 2% solution of silver nitrate. Hellgren [11] prefers Knapp's roller forceps.

May [12] has seen several instances of a mixed form of trachoma and spring catarrh. The symptoms of the latter were added to the former during the prevalence of hot weather.

Vernal Catarrh; Spring Catarrh.—Gradle [13] contributes a summary of conclusions from the observations of vernal catarrh in 8 patients who presented the palpebral form only. The circumcorneal band of infiltration was absent, except in 1 patient, and in this case it was scantily marked. He calls attention to the liability of confusing the palpebral form of vernal catarrh with trachoma. Treatment was symptomatic and the relief temporary only.

Pseudomembranous Conjunctivitis.—Terson [14] asserts that the be-

[1] Rec. d'Ophtal., Jan., 1896.
[2] Ann. d'Oculist., Sept., 1895.
[3] Ann. d'Oculist., Mar., 1896.
[4] Klin. Monatsb. f. Augenh., Jan., 1896.
[5] Ibid., Mar., 1896.
[6] Abst. Ann. d'Oculist., Feb., 1896.
[7] Jour. Am. Med. Assoc., Jan. 11, 1896.
[8] Wien. med. Woch., July, 1895.
[9] Klin. Monatsb. f. Augenh., May, 1896.
[10] Med. News, Jan. 11, 1896.
[11] Centralbl. f. Augenh., Jan., 1896.
[12] Ann. of Ophth. and Otol., Jan., 1896.
[13] Arch. f. Ophth., Oct., 1895.
[14] Ann. d'Oculist., June, 1895.

nignity or malignancy of membranous conjunctivitis does not depend upon the presence or absence of the Löffler bacillus, and bacteriologic examinations are necessary to determine the cause with respect to the advisability of employing the serum, yet Jocqs[1] treated a child with pseudomembranous conjunctivitis, the nature of which was not established by bacteriologic examination. Instillations of a weak solution of silver nitrate seemed to aggravate the corneal lesions; they were then touched with $\frac{1}{10}$ to $\frac{1}{20}$ solution of potassium permanganate, which was followed by better results.

Serious **inflammations after** simple and properly-conducted **tenotomy** of the eye-muscles occur occasionally. Bekess[2] saw in a tenotomized eye the diphtheria common in the preantiseptic days.

Phlyctenular Conjunctivitis.—Bach[3] believes that phlyctenular ophthalmias are directly traceable to pyogenic microorganisms—that in recent cases (2 to 3 days) the microbic invasion can be bacteriologically demonstrated. He states that no direct relation exists between these phlyctenular processes and scrofulous affections of the eyes. Woodward[4] in a clinical study of 200 cases attributed the cause to tubercular or syphilitic taint or predisposition, since he found associated with it rhinitis, pharyngeal adenoids, enlarged cervical glands, facial eczema, and blepharitis.

Nuyts[5] records an instance of **traumatic transplantation of ciliæ** from the border of the lid into the conjunctiva, and of their growth in their new position.

Unusual Forms of Conjunctivitis.—Leber[6] observed 2 cases of a new form of conjunctivitis, which he has termed **"conjunctivitis petrificans."** It is a recurring and spreading inflammation, characterized by the appearance on the conjunctiva, slightly raised from its surface, of whitish patches, in the center of which is found a deposit of lime or chalk.

Steffan[7] calls attention to an intractable conjunctivitis secondary to obstruction of sebaceous follicles in the lid-margin. Treatment directed to the little tumor rapidly cures the conjunctivitis.

The experience of Ahlström[8] would seem to indicate that not all atropin conjunctivitis can be traced to microorganisms in the atropin solution. He believes in an idiosyncrasy toward the local action of atropin on the conjunctiva.

Tumors.—Rombolotti[9] divides **conjunctival cysts** into congenital, including dermoids, traumatic, lymphatic, and those from dilatation of Krause's glands. Rogman[10] and Puech[11] agree as to the construction of serous cysts. Steiner[12] relates an instance of **pigment-adenoma of the conjunctiva tarsi** in a Malay. After expiration the exact diagnosis was made by the

[1] Ann. d'Oculist., July, 1895.
[2] Wien. med. Woch., Sept. 7, 1895.
[3] Arch. f. Ophthal., vol. xli. No. 2.
[4] Va. Med. Semimonthly, May 8, 1896.
[5] Rec. d'Ophthal., May, 1896.
[6] 24th Ophth. Cong., Heidelberg, 1895; Ophth. Rev., Jan., 1896.
[7] Klin. Monatsb. f. Augenh., Dec., 1895.
[8] Ibid.
[9] Ann. di Ottal., Ann. ii. vol. ii. fasc. 9, 10.
[10] Arch. d'Ophtal., July, 1895.
[11] Abst. Arch. d'Ophtal., Feb., 1896.
[12] Centralbl. f. prakt. Augenh., Oct., 1895.

microscope. Ayres's[1] study of 3 cases of **dermoid tumor of the conjunctiva** would indicate that the favorite site of these neoplasms is at the limbus. Bassalino and Hallauer[2] saw a **subconjunctival angioma cavernosum** occurring in a young man 17 years of age. Under the microscope the nature of the tumor was plainly shown.

Rogman[3] removed a tumor of 6 weeks' growth, that proved to be a **carcinoma,** from the limbus in a boy of 12 years.

Sawford[4] describes **ophthalmia nodosa** as a disease caused by the penetration into the ocular tissues of the hair of certain caterpillars.

Ewetzky[5] records a case of bilateral **scleroma of the conjunctiva palpebra** diagnosed with the aid of the microscope.

Pterygium.—Deschamps[6] is of the opinion that in the treatment of pterygium careful and vigorous curetting of the cornea should take the place of the galvanocautery. At a meeting of the Soc. d'Ophtal., Paris,[7] several speakers recommended raclage, or grattage—scraping the denuded cornea with a curet after excision of the head of a pterygium—as the most certain method of preventing opacity, and the same method as effective in clearing the cornea in band-keratitis. Coe[8] is satisfied that the whole trouble in pterygium lies in the apex, and that the vascular supply is not a part of the disease, but only an effect. He secured surprising results in 2 cases by simply touching the apex with the actual cautery. Within 6 days there was scarcely a trace of the former trouble. Steiner[9] by means of the microscope was able to diagnose a cancroid of the cornea that made its appearance at the apex of a pterygium.

Hemorrhage.—Stoewer[10] relates the history of fatal conjunctival hemorrhage in an infant of 6 months. The blood came from a small polyp in the superior culdesac, and ceased only during sleep.

Syphilis.—Snell[11] has observed 9 cases of chancre of the lids and conjunctiva. The preauricular ganglion in all, and in some the submaxillary ganglia, were enlarged. Morton[12] reports a case of secondary ulcer of the conjunctiva in a woman aged 46. The ulcer healed perfectly under specific treatment.

DISEASES OF THE SCLERA.

Episcleritis.—Fuchs[13] describes an infrequent affection of the episclera characterized by congestion of the ocular conjunctiva and intense injection of the episcleral vessels, without, however, the formation of scleral nodules. Fuchs has named the affection "episcleritis periodica fugans." To the above

[1] Am. Jour. Ophth., Oct., 1895.
[2] Arch. f. Ophth., xli. Abt., 1895.
[3] Ann. d'Oculist., vol. cxxii. No. 3.
[4] Ophth. Soc. Unit. King., June, 1895; Ann. d'Oculist., July, 1895.
[5] Beit. z. Augenh., Feb., 1896.
[6] Ann. d'Oculist., July, 1895.
[7] Rec. d'Ophtal., Jan., 1896.
[8] Ann. of Ophth. and Otol., Apr., 1896.
[9] Centralbl. f. prakt. Augenh., Mar., 1896.
[10] Rec. d'Ophtal., Aug., 1895.
[11] Ophth. Soc. Unit. King., June, 1895; Ann. d'Oculist., July, 1895.
[12] Ann. Ophth. and Otol., Apr., 1896.
[13] Wien. med. Woch., No. 34, 1895.

observation Stephenson [1] adds the report of several cases of this newly-described disease in children.

In addition to the usual treatment of episcleritis, varying with the exciting cause or diathesis, Veasey [2] finds that many cases that resist all other treatment are markedly improved by a few applications of galvanism.

Parasites.—Hirschberg [3] reports finding an ocular parasite, the filaria loa (see the *Year-Book* for 1896, p. 778), imbedded between the sclera and the choroid of a South African negro. He extracted it without difficulty.

THE IRIS AND CILIARY BODY.

Congenital Anomaly.—*Albinism.*—Malgot [4] holds light irides to be a variety of albinism, an arrest of development of the pigment-granules, arising from an imperfect nutrition of the anterior section of the eye. Four cases of **albinism** are reported by Jennings.[5] In all of them there was marked diminution of the visual acuity.

Physiology.—Gifford [6] states that contraction of the pupil is associated with strong contraction of the orbicularis, and particularly the palpebral portion of the latter muscle. He explains this iris-reaction by Mendel's theory that the fibers of the 7th nerve, which supply the orbicularis, arise from the nucleus of the 3d, remarking, however, that it is equally explainable by Bechterew's idea that special fibers connect the nucleus of the 3d with the 7th nerve. This view is strengthened by Silex's [7] investigations of 3 cases of paralysis of the orbicularis, without paralysis of other muscles supplied by the 7th. Marina [8] records his conviction that the frequency of iridoplegia in tabes argues for an extracerebral center, or at least for a second center interpolated between the oculomotor and short ciliary nerves. [This view is in accord with the neuron-theory.] Marina inclines to the belief that the principal center for pupillary contraction is to be found in the ciliary ganglion.

Functional Diseases of the Iris and Ciliary Body.—Moll [9] in reviewing 150 cases of **postdiphtheric cycloplegia** seen in Hirschberg's clinic found the average duration of the paralysis to be about 4 weeks. He also discovered that abducens paralysis occurred in more than 10% of the cases, and feels that, after diphtheria, examination of the eyes of children with a red glass for diplopia would reveal abducens paralysis in a much greater percentage of cases than is now thought to obtain.

Feilchenfeld [10] relates that several army officers partook of some canned oysters and showed general toxic symptoms 5 days afterward. They all complained of inability to read, but only one of them submitted himself to examination, when it was found that there was complete paralysis of accommodation, which lasted for 2 weeks.

[1] Med. Press and Circ., Mar. 18, 1896.
[2] Ther. Gaz., Feb. 15, 1896.
[3] Berl. klin. Woch., Nov. 4, 1895.
[4] Rec. d'Ophtal., Aug., 1895.
[5] Am. Jour. of Ophth., Jan., 1896.
[6] Arch. of Ophth., July, 1895.
[7] Arch. f. Augenh., xxxii. pt. 2.
[8] Ueber multiple Augenmuskel-Lähmungen, Leipzig, 1896.
[9] Centralbl. f. prakt. Augenh., Jan., 1896.
[10] Klin. Monatsb. f. Augenh., Apr., 1896.

Henry[1] has constructed a pupillometer which enables him to show that **the pupil** always **reacts when a portion of the iris is submitted to the action of light,** without modifying the illumination of the retina. A dark-colored iris will dilate more than a light one. The author views this as an explanation of the photophobia of iritis at times when the retina is not involved in the inflammatory process.

Diagnosis of Iritis.—According to Friedenwald,[2] the cornea is affected in every case of iritis. In no case does it retain its perfect transparency. The opacities consist of deposits upon Descemet's membrane and infiltrations in the substantia propria. It is these deposits which cause the pupil and iris to appear blurred and hazy, and which are often referred to as muddiness of the aqueous humor.

Manz[3] affirms that **ocular tuberculosis** is more frequent than is generally supposed. He claims that often the iritis is assumed to be rheumatic or luetic when careful search into the general condition of the patient and the family history would reveal the true nature of the disorder. He looks upon the formation of small grayish-white nodules in the conjunctiva, cornea, or iris as a valuable diagnostic sign.

Iritis of nasal origin is reported by Fage.[4] There was no other cause than atrophic rhinitis.

Acute Plastic Iritis.—The analysis of Bruns'[5] 105 cases indicates that acute plastic iritis, whether specific or not, is a self-limited disease, and that, while local treatment is of the greatest value in soothing the pain and preventing adhesions, constitutional treatment will not tend to shorten the duration of the disease. Tansley[6] reports a case of iritis that continued over 18 months with numerous relapses, in which no cause could be shown. Gaupillat[7] shows that anterior synechiæ predispose an eye to long and repeated attacks of inflammation and perhaps sympathetic disease. Terson[8] accords with this view.

Iridocyclitis.—In the case of a man reported by Oswalt,[9] aged 39, a gumma developed 14 years after syphilitic infection in the upper outer ciliary region, growing into the anterior chamber. The tumor finally decayed under antisyphilitic treatment. Gallenga[10] observed an instance of gumma of the ciliary body that appeared 2 months after infection. Ellett[11] records a case in a man aged 29 of plastic cyclitis, with localized exudation, occurring early in secondary syphilis and resembling gumma of the ciliary body.

Leprosy.—Norsa[12] describes leprous iritis. In the nodules which form in this intense variety of ocular inflammation leprous bacilli may be found.

[1] Acad. of Sci., Ann. d'Ocul., July, 1895.
[2] Arch. of Ophth., Apr., 1896.
[3] Münch. med. Woch., Nov. 15, 1895.
[4] Arch. d'Ophtal., July, 1895.
[5] Med. News, July 20, 1895.
[6] Trans. Am. Ophth. Soc., 1895.
[7] Rec. d'Ophtal., June, 1895.
[8] Ibid.
[9] 24th Ophth. Cong., Heidelberg, 1895.
[10] Ann. d'Oculist., Sept., 1895.
[11] Ann. of Ophth. and Otol., Apr., 1896.
[12] Boll. d'Oculist., xvii. Ann. —; abst. Arch. d'Ophtal., Feb., 1896.

Grandclement[1] finds that **hernia of the iris,** left to itself, constitutes a permanent menace to the eye. He advises incision by boldly dividing the hernial protrusion into equal parts in the direction of its greatest diameter. [Experience amply justifies this fear.]

Suker[2] pronounces **ephedrin hydrochlorate** the best mydriatic for diagnostic purposes, because of its rapidity of action, the short duration of its effects, its noninterference with accommodation or intraocular tension, its maximum dilatation of the pupil, and its freedom from untoward effects.

Tumors of the Iris.—In a case of carcinoma of the iris and ciliary body reported by Robertson[3] the disease, though primary, sprang from the iris rather than from the ciliary body. Hansell[4] reports 2 cases of tumor of the iris—1 a pearl cyst due to traumatism, the other a fibroma in which no tubercles could be discovered on staining.

Injuries.—Isolated rupture of the iris, perpendicular to its radiating fibers, and unaccompanied by any injury whatsoever of the adjacent tissues, is reported by Reber.[5]

SYMPATHETIC OPHTHALMIA.

Pathogenesis.—Deutschman's migration theory has not been supported by recent investigations, and in view of the reports of carefully conducted examinations by DeSchweinitz,[6] Stricker,[7] Bach,[8] Burgeois,[9] Ring,[10] and Collins,[11] the theory should be abandoned. DeSchweinitz found no bacilli in 3 cases of enucleation for threatening sympathetic ophthalmia following injuries. Further evidence that sympathetic inflammation is not due to the migration of bacilli is furnished by Collins, whose thorough investigation of an eye enucleated during the active stage of inflammation of both eyes failed to reveal the presence of microorganisms. Bach's experiments convince him that a migration of bacteria from the first to the second eye along the optic sheaths does not occur in the sense of the migration-theory. The path of the irritation is from the first eye through the ciliary nerves to the ciliary ganglion, through the sympathetic root of the latter to the carotid plexus of the same side, then through the circle of Willis to the carotid plexus of the other side, and then in a centrifugal direction to the ciliary ganglion and the ciliary nerves of the second eye. In a later communication[12] Bach adheres to his original position. As to therapy, he argues for section of the ciliary nerves. Evisceration is surer than the previous measure, but enucleation offers the greatest security. Zimmerman[13] states that in a close anatomic study of a case of sympathetic ophthalmia he found unmistakable direct transmission of

[1] La Méd. mod., 6 Ann., No. 38.
[2] Ann. Ophth. and Otol., Jan., 1896.
[3] Ophth. Rev., Dec., 1895.
[4] Trans. Am. Ophth. Soc., 1895.
[5] Arch. of Ophth., Apr., 1896.
[6] Jour. Am. Med. Soc., Oct. 26, 1895.
[7] Ref. Am. Jour. Ophth., Sept., 1895.
[8] 24th Ophth. Congress, Heidelberg, 1895, and Arch. of Ophth., Oct., 1895.
[9] Rec. d'Ophtal., July, 1895.
[10] Manhattan Eye and Ear Hosp. Rep., 1895.
[11] Lancet, Nov. 16, 1895.
[12] Arch. f. Ophth., pt. 1, 1896.
[13] Ibid., pt. 2, 1896.

pathogenic micrococci from the offending to the sympathizing eye. Stricker,[1] too, notwithstanding negative bacteriologic findings in a case of his own, allies himself with the apostles of "migration." He is convinced that "every perforating wound of the eye, be it the result of disease, accident, or operation, opens the door for the entrance of pathogenic microbes, without which there can be no sympathetic ophthalmia."

Prognosis.—Rogman[2] believes that sympathetic ophthalmia is not an incurable disease, although a cure must not be admitted until some years have passed. This conclusion is confirmed by Lagner,[3] who reports 5 cases (2 of which formed the basis of Rogman's article) that in spite of enucleation of the injured eye developed severe sympathetic iridochoroiditis. By treatment and operations vision, that had been nearly lost, was restored. Ledbetter[4] and Simi[5] had similar fortunate experiences. The former lost a left eye after discission of a soft cataract. The right eye, on which he had previously done the same operation with good results, sympathized, and vision was reduced to counting fingers. Enucleation immediately relieved the inflammatory symptoms and saved the remaining eye. Simi treated a case of violent sympathetic inflammation by enucleation of the exciting eye, subconjunctival injections of cyanid of mercury and mydriatics locally, and corrosive sublimate internally, finally securing $\frac{7}{10}$ of normal vision.

Opticociliary neurotomy [an operation that has few advocates] was successfully performed by Burnham in sympathetic disease.[6]

Sponge-grafting.—Belt[7] suggests, after removal of the ball, the insertion of a piece of sponge, over which the conjunctiva is sutured, in the socket. The interstices of the sponge become filled with hard flesh, furnishing a firm support for an artificial eye.

GLAUCOMA.

[The tendency among clinicians to disassociate simple or noninflammatory glaucoma from the category of glaucomas is evident since Schweigger's masterly article, published 3 years ago in the Archives of Ophthalmology.]

A careful analysis of a series of cases has been prepared by Zentmayer and Posey.[8] The systemic diseases predisposing to simple glaucoma are rheumatism and influenza, typhoid and malarial fevers, and other devitalizing conditions. Some of their observations may be briefly stated: The disease is almost without exception binocular, an average period of 20 months elapsing between the involvement of the first and second eye. In 32 of the eyes with full visual acuity there were distinct glaucomatous excavations; in the majority of cases there were no signs of inflammatory process. The pupils were dilated ad maximum in 19—5 of which were sluggish and 14 nonresponsive. The media were clear in only 47 cases. Every nerve the seat of a glaucomatous

[1] Loc. cit.
[2] Ann. d'Oculist., Aug., 1895.
[3] Ibid., Nov., 1895.
[4] Ann. of Ophth. and Otol., Oct., 1895.
[5] Abst. in Arch. d'Ophtal., Feb., 1896.
[6] Canad. Pract., May, 1896.
[7] Med. News, June 27, 1896.
[8] Arch. of Ophth., July, 1895.

excavation was gray, green, or blue in tint. In 65 the excavations involved the entire nerve-head, averaging 3.37 D. in depth. A broad scleral ring all around occurred in 147, and marked halo 31 times. Simi[1] ascribes a case of glaucoma to aortic insufficiency. Simon[2] states that a careful estimation of the visual fields in glaucoma will often show peripheral scotomata, relative or absolute, just skirting along the margin of the already contracted field. They are of considerable prognostic value in his mind, inasmuch as they precede the formation of sectors or defects in whatever portion of the field they may be found.

Lippincott[3] saw a case of simple glaucoma develop into the inflammatory form.

Theories.—The retention-theory—that is, the interruption of the escape of the secretions through the angle of the anterior chamber—is strengthened by experimental investigations of Beutzen and Leber,[4] but they are not prepared to say what factors may cause this interruption. This view is also held by Koster.[5]

As to the part that the endothelial cells of the anterior chamber may play in the etiology of glaucoma, Alt[6] says: "From my specimens it seems to me apparent that the obliteration of the iris-angle is surely not due alone to pressure from behind, but to a new formation of tissue in the iris-angle, which, when contracting, pulls the iris-periphery toward the corneal border, and when it shrinks farther leads to union between the iris and corneoscleral tissue." Radzveitzky[7] had an unfortunate experience. A few hours after iridectomy for simple glaucoma the instillation of 4% cocain solution developed acute glaucoma. In spite of eserin, morphin, and antipyrin, the symptoms continued intense, and disappeared slowly only after sclerotomy. Zirm[8] lays stress on narrowing of the vortex-veins as contributing largely to the clinical picture of glaucoma.

Diagnosis.—Galezowski[9] differentiates glaucomatous excavation in atrophy of the nerve from the simple excavation of atrophy of spinal origin, thus: In glaucoma the papilla is white, particularly externally; the central veins of the optic nerves are diminished in volume at their point of emergence, but at the border of the disk they become larger; there is pulsation of the central artery under digital pressure; the pupil contracts to light, but is dilated and irregular; the visual field is limited above, and, much later, in the remaining portions; dyschromatopsia does not exist at the beginning, but later becomes marked; the knee-reflex is preserved, and there are no shooting pains; the affection is gouty, rheumatic, or syphilitic.

Germann[10] reports a case of empyema of the right antrum of Highmore,

[1] Bull. d'Oculist., xvi. year; ref. Arch. d'Ophtal., Nov., 1895.
[2] Centralbl. f. prakt. Augenh., Apr., 1896.
[3] Trans. Am. Ophth. Soc., 1895.
[4] Arch. f. Ophth., Bd. xli. Abt. 3.
[5] Ibid., Abt. 2.
[6] Am. Jour. of Ophth., May and June, 1896.
[7] Arch. d'Ophtal., Aug., 1895.
[8] Arch. f. Ophthal., 1895, pt. 4.
[9] Acad. de Méd., Oct. 29, 1895; Ann. d'Ophtal., Nov., 1895.
[10] St. Petersb. med. Woch., 1895.

presenting all the symptoms of glaucoma, in which the right eye was iridectomized. Later the antrum-trouble was discovered and relieved, whereupon all the eye-symptoms disappeared.

Treatment.—Testimony as to the great value of the medicinal treatment of glaucoma is furnished by Cohn.[1] By the daily use of a ½% solution of eserin sulphate for 14 years acute attacks had been either prevented or cured, and the acuity of vision and the visual field had been preserved. An omission of the instillation would be followed by glaucoma symptoms. Iridectomy is justified only in those cases in which the employment of myotics cannot check the evolution of the disease, since its results are inferior to the treatment by myotics. Abadie[2] too believes that simple glaucoma is not cured by iridectomy, but is more amenable to systematic and prolonged local instillation of eserin or pilocarpin, and to the administration internally of potassium bromid and quinin. Simi[3] concurs in this treatment. On the other hand, Nettleship[4] urges iridectomy first in cases of optic atrophy occurring during the glaucoma-period of life, in which there is distinct cupping of the disk, even though the tension may not be increased; and secondly, even in those cases in which the field of vision is cut off close to the fixation-point; thirdly, in simple glaucoma, early in the disease; fourthly, sometimes in the prodromal stage, especially in young persons. The order of remedies adopted by Wicherkienicz[5] is first eserin, then sclerotomy, and finally iridectomy. Ramsey[6] advises iridectomy in all forms of glaucoma so soon as the diagnosis is established.

Indovini[7] reports results of operations of division of the external nerve (**operation of Badal**) performed by Angellucci in 13 cases. The operation cannot be considered as a radical treatment of glaucoma, but as an excellent means to control pain in absolute glaucoma. Pain can be relieved, according to Sutphen,[8] by sodium salicylate. Risley[9] has had equally good results from sodium biborate, and thinks it is the sodium that is the valuable agent.

Abadie[10] adds a new case of **sympathetic glaucoma** to the very few that have been reported. The second eye was cured, not by iridectomy or sclerotomy, which he discountenances, but by enucleation of the first eye and by instillation of eserin.

Schweigger[11] says glaucoma not unfrequently shows a **malignant tendency after iridectomy.**

DISEASES OF THE CHOROID.

Hemeralopia.—Krienries[12] looks upon hemeralopia as choroidal, and not retinal, in origin. He thinks it occurs only in the presence of ocular mal-

[1] Berl. klin. Woch., May 27, 1895.
[2] Acad. de Méd., Oct. 22, 1895; ref. Arch. d'Ophtal., Nov., 1895. [3] Loc. cit.
[4] Brit. Med. Jour., Oct. 19, 1895.
[5] Klin. Monatsb. f. Augenh., May, 1896. [6] Glasg. Med. Jour., vol. xliii. No. 4.
[7] Rec. di Ottal., vol. ii. fasc. 7, 8; ref. Rec. d'Ophtal., Jan., 1896.
[8] Trans. Am. Ophth. Soc., 1895. [9] Ibid.
[10] Arch. d'Ophtal., Feb., 1896. [11] Arch. of Ophth., Apr., 1896.
[12] Ueber acute idiopathische Hemeralopia, Wiesbaden, 1896.

nutrition, and that the predisposition may be either congenital or acquired. This ocular malnutrition gives rise, in turn, to a disturbance in the balance between the production and the use of the visual purple. The most efficient treatment thus far found is strychnin, hypodermically, in increasing doses. Carpenter[1] considers colloid changes in the choroid and "drusen" of the optic nerve-head, viewed from the ophthalmoscopic and clinic standpoint, as identical.

Albuminoid deposits in the optic disks and retina are, according to Heyl,[2] derived from the choriocapillary system.

Conus.—Randall[3] urges the careful study in all refractive conditions of the excavation and configuration of the disk, trend of the vessels, and pigment alterations of the choroid, especially conus.

Inflammation.—Rochon-Duvignaud[4] believes that in specific retino-choroiditis the choroid is primarily affected, the retina secondarily, because the retinal lesions are limited to the foveal region, while those in the choroid are more disseminated. Houdart[5] found concentric limitation of the field in a case—[a finding that tends to disprove the assertion that the retinal lesions are limited to the foveal region]. The fields were enlarged by mercuric inunction. Schmeichler[6] records 3 cases of metastatic choroiditis, 1 secondary to purulent cystitis, the second to a splenic abscess, the third directly consequent to puerperal fever. The ages of the patients were 74, 25, and 35, respectively.

Tumors.—Mitvalsky[7] argues that choroidal tumors (sarcoma) may develop only laterally, and involve the whole uveal tract without projecting into the vitreous, and can be recognized during life only very late in their course by the formation of episcleral nodules. Griffith[8] reports 2 cases of choroidal sarcoma in infancy. The author believes that intraocular neoplasms occurring in infancy are sarcomata, whether their seat of origin be in the retina or in the choroid.

Microscopic examination of sarcoma of the choroid, arising from injury, made early in its progress by Buller,[9] shows that the growth is almost wholly confined to the choroid. Eighteen months after enucleation there was no recurrence. [Cases that have survived 15 years after enucleation of the choroidal sarcoma have been reported.]

Guaita[10] describes the third case recorded in literature of myoma of the choroid. Its origin is in the fine muscular tissue of the choroid, and its growth, by proliferation of its superficial elements, rapid.

Detachment.—Marshall[11] has observed 3 cases of detachment of the choroid, 2 subsequent to glaucoma, and one 3 months after the extraction

[1] Jour. Am. Med. Assoc., Nov. 2, 1895.
[2] Trans. Am. Ophth. Soc., 1895.
[3] Jour. Am. Med. Assoc., Nov. 16, 1895.
[4] Arch. d'Ophtal., Dec., 1895.
[5] Rec. d'Ophtal., Nov., 1895.
[6] Wien. med. Woch., Aug. 17, 1895.
[7] Arch. of Ophth., Oct., 1895.
[8] Rec. d'Ophtal., Sept., 1895.
[9] Trans. Am. Ophth. Soc., 1895.
[10] Ann. di Ottal., xxiv. fasc. i., 1895; abst. Arch. d'Ophtal., Feb., 1896.
[11] Ophth. Soc. Unit. King., Oct. 17, 1895; Ann. d'Oculist., Nov., 1895.

PLATE 12.

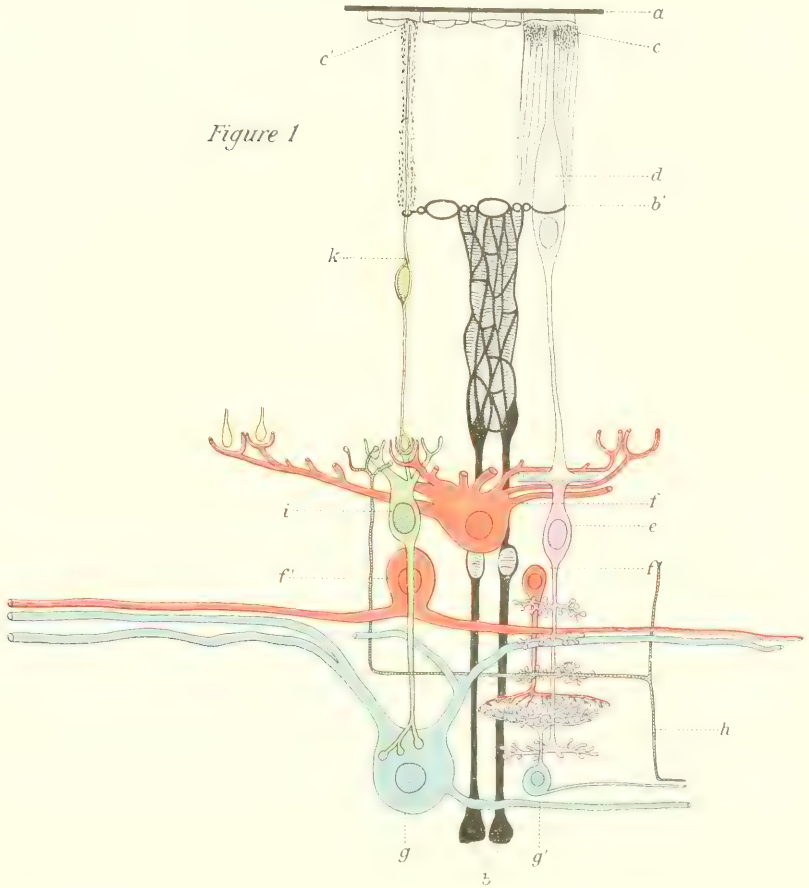


Figure 1

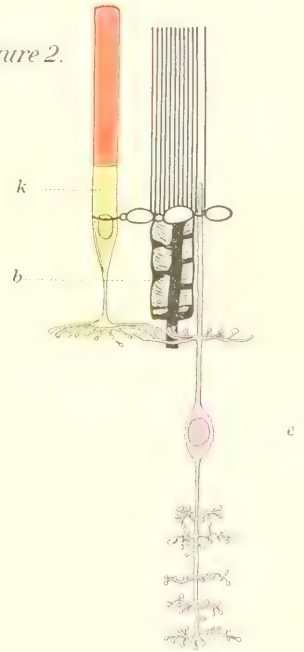


Figure 2.

FIG. 1.—Schematic section of the mammalian retina. FIG. 2.—Scheme of the relation of the rod- to the cone-system as existing in the retinæ of amphibians, reptiles, and birds. (Ernst Weinland, Neue untersuchungen über die Funktionen der Netzhaut, Tübingen, 1896.)

of cataract. Under the choroid were found serous and fibrous exudation and the formation of cysts.

Heyl[1] believes that **spontaneous rupture** of the choroid is horizontal when its seat is in the macular region, and that it is caused by spasmodic contraction of the external rectus or a number of such contractions—that the macular changes found in high myopia may arise from excessive action of the external rectus. How far the choroid coat is involved is unknown. The conspicuous feature of the lesion is the splitting of the pigmentary layer of the retina.

DISEASES OF THE RETINA.

Anatomy.—Hosch[2] adheres to the classical division of the retina into three layers. Norris[3] shows by microphotographs that the rods and cones in the human retina are connected by loops—each rod with its adjacent cones—and believes that the seat of light-perception is in the outer segment of the rods and cones, which are the only parts of the retina that are bathed in the visual purple. Weinland[4] states that there is but one visual substance in the retina, which has its seat in the summit of the "goblet" (the so-called pigment-) cells (see Plate 12). The chemic change which light works on the visual substance produces an increase in volume of the goblet-cells, transmitted to the rods as a pressure-stimulus. [The theory of referring our perception of light to what is primarily a pressure (instead of a vibratory) phenomenon is so radical a departure from generally accepted views that it will require the greatest plausibility before it can be adopted even as a working theory.]

Physiology.—Posey[5] regards the different forms of visual perceptions as expressions of impaired function, or merely symptoms of disease of the nervous structure of the eye or of the expansion of the optic nerve within the brain.

Light-sense.—Ahlström[6] finds "the sensibility to luminous impressions is not the same throughout the entire retina, but greatest in the fovea and neighboring parts, and diminishes uniformly toward the periphery. [The information gained in these and similar experiments is entirely subjective, and must depend not only on the sensibility of the retina, but the ability to discriminate between sensations, which varies according to the personal equation.]

Retinal Tire and Hysteria.—Schmidt-Rimpler[7] believes concentric contraction of the visual field, frequently found in hysteria, to be a simulated condition. Sudden loss of vision continuing 8 days and returning as suddenly occurred in a young hysterical woman under the care of Claiborne.[8] Berger[9] calls attention to the hysterical zones of the retina in certain patients. In the case detailed the patient had a very high degree of hyperopia and astigmatism,

[1] Trans. Am. Ophth. Soc., 1895.
[2] Arch. f. Ophth., Bd. xli. Abht. 3.
[3] Trans. Am. Ophth. Soc., 1895.
[4] Neue untersuchungen über die Function der Netzhaut, Tübingen, 1895.
[5] Univ. Med. Mag., Dec., 1895.
[6] Ann. d'Oculist., Mar., 1896.
[7] Wien. med. Woch., Oct. 19, 1895.
[8] N. Y. Polyclinic, Oct. 15, 1895.
[9] Arch. d'Ophtal., June, 1895.

suffered attacks of intense pain, and had concentric limitation of each field, particularly on the most painful side. After use of the eyes and after attacks of pain the field of vision was decreased. [The hysterical symptoms in these cases were most likely due to the prolonged use of eyes that were entirely unfitted for near-work, and the limitations of the field were rather functional than hysterical.]

Amblyopia.—Johnson[1] adds a third to his 2 cases of amblyopia exanopsia previously reported.

Retinal Hemorrhage.—Vialet[2] reports a case of double retinal hemorrhage in a young man that he traced to hemophilia, because his grandfather, father, and daughter were subjects of severe hemorrhage from insignificant causes. The urine showed neither albumin nor sugar. Trousseau[3] gives as a cause of repeated retinal hemorrhages in a man of 30 the excretion of large quantities of urea and phosphates in the urine. By treatment the urine was rendered normal and the hemorrhages ceased. Friedenwald[4] cites 2 cases of hemorrhage into the retina and vitreous, both of which presented such marked evidence of vascular disease as to lead to the view that in young persons intra-retinal hemorrhage may be often due to disease of the retinal vessels. In another communication[5] he enters minutely into the details of 2 somewhat similar cases originating in demonstrable lesions of the retinal veins.

Three cases of pernicious anemia, caused by the presence of tenia, exhibiting profuse retinal hemorrhages, are reported by Natanson.[6] Violent exercise will at times produce rupture of a retinal vessel, as is instanced by the case of Foster,[7] in which a blind spot caused by a large macular hemorrhage was noticed by the patient while "scorching." The 4 cases of injury to the eye by a blow from a blunt object investigated by Siegrist would seem to indicate that the resulting choroidal and retinal changes, as seen with the ophthalmoscope, are to be ascribed to a rupture of one of the ciliary arteries in the external tunics of the globe.[8] Two instances of circumscribed macular hemorrhage are reported by DeSchweinitz,[9] one following iridectomy done for glaucoma, the other in a woman of 66 who was the subject of chronic heart-disease.

Albuminuric Retinitis.—Nuel[10] finds the pathology of the macular changes in albuminuric retinitis to consist in hypertrophy of the rods and cones and their inclination toward the fovea, instead of being at right angles to the plane of the retina. In the external granular layer are patches filled or surrounded by exudation. This exudation is, as a rule, homogeneous, albuminous, and fibrous. The interstitial edema separates the normal fibers in their length, making large spaces between them. Study of the exudation demonstrates

[1] Trans. Am. Ophth. Soc., 1895.
[2] Rec. d'Ophtal., June, 1895.
[3] Ibid., Aug., 1895.
[4] Trans. Am. Med. Assoc., 1895.
[5] Centralbl. f. prak. Augenh., Feb., 1896.
[6] Ref. Rec. d'Ophtal., Nov., 1895.
[7] N. Y. Med. Jour., Feb. 1, 1896.
[8] Mittheilungen aus Klin. und Med. Institut. der Schweiz, Series 3, p. 9.
[9] Am. Jour. Ophth., Feb., 1896.
[10] Arch. d'Ophtal., Oct., 1895.

positively that these changes have taken place during life. Just under the macula the choroid exudes a lamella of tissue, destroying the rods and cones, and a homogeneous substance that seems to be identical with the retinal exudation and probably produced at the same time. It causes a minute detachment of the retina.

Retinitis Pigmentosa.—Belt[1] recites fully 2 family histories in which 50% of the members were affected with retinitis pigmentosa. In neither family could any history of eye-trouble, syphilis, or inebriety be shown. On the other hand, there was close consanguinity in both families, which is adduced as an argument for consanguinity as a factor in retinitis pigmentosa. These views are negatived by Hansell's[2] case. He met the disease in a deaf-mute, who was of fine physical proportions, excellent health, and whose history, likewise his family history, was absolutely negative. Atwood[3] observed marked night-blindness, probably hereditary, in a young man who had no other ocular symptoms of retinitis pigmentosa. In a case of retinitis pigmentosa with hemeralopia of many years standing Trantas[4] found double annular scotoma between 20° and 40°, according to Parinaud's perimeter, with

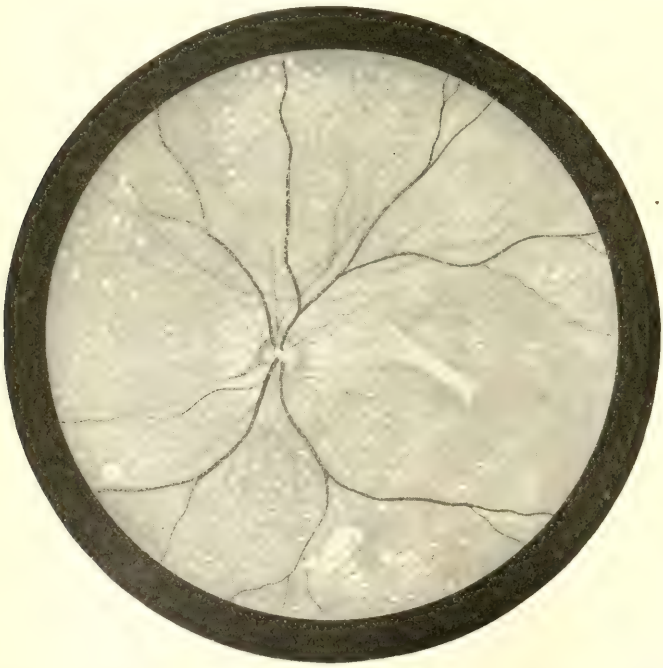


FIG. 149.—Upright image, left eye, of one of Hirschberg's cases of congenital specific retinitis. Vision in this eye, with —7.00 D. S. = $\frac{2}{3}$ (Deutsch. med. Woch., 1895, Nos. 26, 27).

otherwise normal fields. [This is a very uncommon condition. There was no error in the examinations, as they were repeatedly verified.]

[1] Med. News, Jan. 18, 1896.
[2] Am. Jour. Ophth., Mar., 1896.
[3] Roy. London Ophth. Hosp. Rep., 1895, pt. 1.
[4] Rec. d'Ophtal., June, 1895.

Annular scotoma has been found in hyperemia of the retina from the glare of electric light, from direct exposure to the sun's rays,[1] in lead-poisoning, in chorioretinitis of specific origin, and in disseminated choroiditis.

Diabetic Retinitis.—Alt[2] adds 3 to the 60 cases of diabetic retinitis reported up to date; 1 of his cases was typical, the other 2 atypical.

Syphilitic Retinitis.—Hirschberg[3] directs attention to the frequent, but often overlooked, occurrence of deep-seated eye-diseases in congenitally syphilitic children. Next to diffuse keratitis in order of frequency he places a peculiar form of retinitis consisting in a pigment-disturbance of the retinal periphery (see Fig. 149). He urges the careful ophthalmoscopic study of all suspected cases in children, no matter how young. Mercurial inunctions have been marvellously efficient in his hands.

Detachment of the Retina.—Bach[4] shows that in animals, after a retina has been detached 2 months, the ganglion-cells undergo degeneration of their finer elements to such a degree as to render fruitless any attempt at restoring their function by reattaching the retina. From this he concludes that after a certain period (longer in man than in animals because of differences in circulation) nothing can be gained by securing the reattachment of the loosened retina. According to Galezowski,[5] retinal detachment is due to a disease of the lymphatic vessels, through which passes nutritive material to the choroid and ciliary body, with consequent alteration of the supply of new material. Teillas[6] reports a case of double detachment of the retina in a child with pertussis. Tweedy[7] has operated on many cases by all the known methods without obtaining permanent recovery. His statement is not supported by Wray,[8] who operated on a patient by puncture 8 years after the retina had become detached, followed by daily injections of pilocarpin and rest in bed. Vision was improved from light-perception to $\frac{1}{4}$. The contra-indications for operation are—1. Detachment in the macular region; 2. Extensive hemorrhage; 3. Very low tension. Little, Walker, and Marshall[9] have had successes, and Lang and Jessup[10] have seen spontaneous recovery.

Milliken's[11] case of macular detachment occurred in a man 80 years old. The eye had previously been perfectly healthy. The detachment was a small one, limited to the macular region. There was complete spontaneous reattachment of the membrane in 3 months, and visual acuity of $\frac{6}{9}$ with a correcting glass. Gourfinkel[12] reports a case of spontaneous cure of a large detachment of the retina in an eye that was damaged by iridochoroiditis. Marchetti[13] advises for detachment puncture of the sclera, rest in bed, pilocarpin and mercury; while Simi[14] has had imperfect success with the electrolytic treatment of detached retina.

[1] Sous, ref. Rec. d'Ophtal., Nov., 1895. [2] Am. Jour. Ophth., May, 1896.
[3] Deutsch. med. Woch., Nos. 26 and 27, 1895. [4] Arch. f. Ophth., Bd. xli. Abt. 3.
[5] Rec. d'Ophtal., June, 1895. [6] Gaz. méd. de Nantes, 1895; Rec. d'Ophtal., Oct., 1895.
[7] Ophth. Soc. Great Brit., Nov. 14, 1895. [8] Ibid. [9] Ibid. [10] Ibid.
[11] Am. Jour. Ophth., Dec., 1895. [12] Arch. d'Ophtal., Aug., 1895.
[13] Arch. di Ottal., Ann. ii. vol. ii. fasc. 5, 6.
[14] Boll. d'Oculist., xvii. Ann.; abst. Arch. d'Ophtal., Feb., 1895.

Tumors.—Treacher Collins[1] enucleated both eyes for glioma in 4 cases. If it be true that glioma always recurs in 3 years, the 4 cases were cured. Bocchi[2] reports a case of tumor of the retina of a sarcomatous nature.

Choroiditis after measles may eventually show the characteristic symptoms of glioma. The choroiditis may give at first no signs of its presence, but later the vitreous becomes filled with yellow exudations. Cramer and Schultze[3] examined the ball of a girl of 15 which had shown before enucleation signs of glioma, but there had never been a local inflammation, and the only history was that of scarlatina 10 years previously.

DISEASES OF THE VITREOUS BODY.

Hemorrhage.—In the case of a young man, the subject of vitreous hemorrhage in both eyes, who remained amblyopic for several months in spite of internal medication, Abadie[4] penetrated the vitreous of the left eye with a very fine platinum-pointed needle connected with the positive pole of a galvanic battery, the negative pole being applied to the arm. For 5 minutes he passed a current of about 3 or 4 ma. The following day the patient could count fingers. Vision improved until he could read names and numbers on houses. The right eye (not treated) remained without qualitative perception of light and the vitreous opaque. Kipp[5] noted in a boy's right eye hemorrhage into the vitreous. Some years afterward the patient had an attack of a similar nature in the left eye. Vision gradually rose to normal; 6 years later he had a second attack in the left eye, from which he fully recovered.

Berry[6] has used chlorin-water injections into the vitreous to prevent purulent inflammation in the beginning of septic disease and after the removal of foreign bodies.

Subjective Visual Perceptions.—Gould[7] urges that these have not been studied by scientific methods to the extent their importance warrants, and he proposes for them a more definite classification and nomenclature. He classes them as—1. peripheral, 2. central, and 3. combinations of the two, which he calls peripherocentral or centroperipheral according as they are primarily or preponderatingly peripheral or central. He proposes to call all positive light-sensations phoses, and to divide them into peripheraphoses and centraphoses, according to their origin. Absence or interruptions of light-sensations, as scotomata, shadows, whether formless or of more or less indeterminate form, he would call aphoses, and divide according to origin into peripheraphoses and centraphoses. Colored light-sensations would be chromophoses, and could be subdivided, according to the color exhibited, as erythrophoses when red, cyanophoses when blue, xanthophoses, indikophoses, ionophoses, chrysophoses, etc.

[1] Ophth. Soc. Unit. King., Oct. 17, 1895; Ann. d'Oculist., Nov., 1895.
[2] Ann. d'Oculist., Sept., 1895.
[3] Arch. of Ophth., Apr., 1896.
[4] Rec. d'Ophtal., Oct., 1895.
[5] Trans. Am. Ophth. Soc., 1895.
[6] Abst. Am. Med.-Surg. Bull., Apr. 18, 1896.
[7] Med. News, Sept. 14, 1895.

DISEASES OF THE OPTIC NERVE.

Anatomy.—According to Greeff[1] the optic nerve is made up of fibers representing prolongations of nerve-cells found chiefly in the ganglion-cell layer of the retina, terminating finally in the primary optic center of the brain. Other fibers originate in the brain and terminate in the retina. Manz[2] regards opaque nerve-fibers as a congenital malformation. (Pl. 13.)

Drusen, or Glands.—Sachsalber[3] cites a case of drusen in the optic nerves of two eyes otherwise normal. A careful study of the sections indicates that they are the result of hyaline degeneration of the connective tissue in the nerve-head. On the other hand, Gifford[4] considers drusen were the primary cause of blindness in a 9-year-old boy because, by their enormous development, they suppressed the arterial circulation.

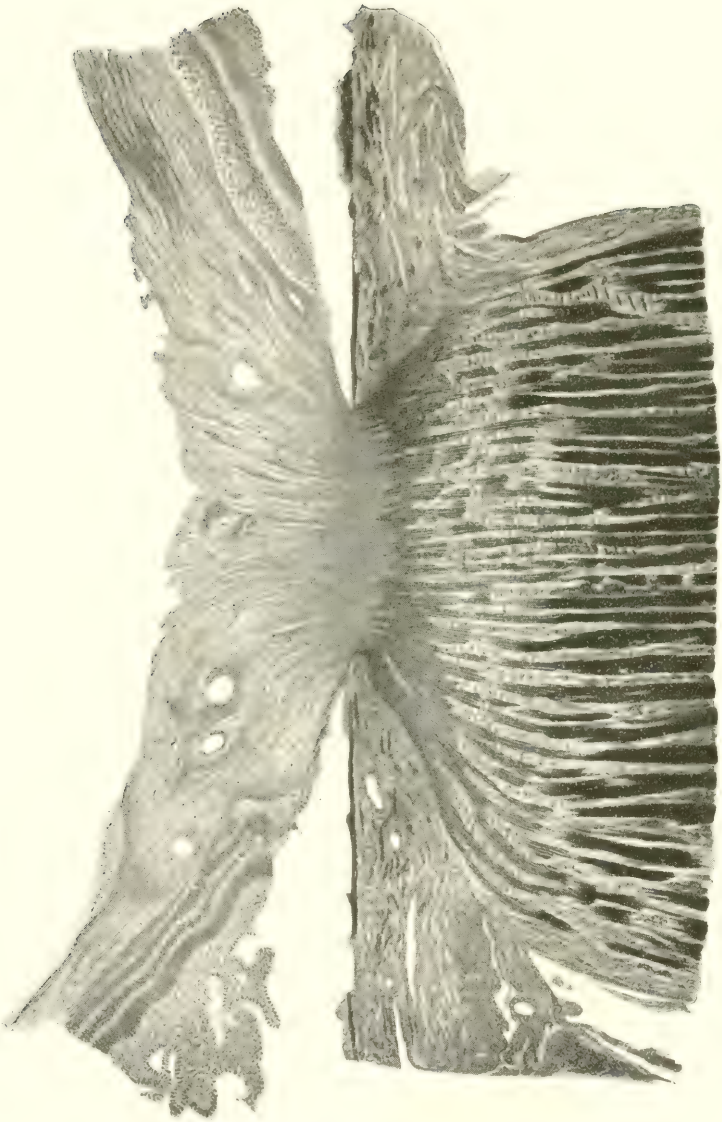
Decussation of the Tracts.—Rakowicz[5] questions the existence of nasal hemianopsia, pure and simple, as the result of pressure on both sides of the chiasm. [To attempt to explain the clinical features of hemianopsia in man by anatomic findings in the lower animals seems to us an error. The different arrangement of the optic nerve-fibers in man from that of the lower animals has been too abundantly proved to permit the application of Rakowicz's idea.] Michel and Kölliker go even farther. They assert the total decussation of the optic nerves at the chiasm.[6]

Up to the present time it has been held by all investigators that the **removal of the occipital lobes** of dogs and monkeys causes complete blindness. Vitzon,[7] repeating this experiment on a monkey, observed that the animal began to notice objects again (with much difficulty) about 4 months after the operation, which would indicate regeneration of the destroyed section of the brain. The new substance is nervous tissue, and not hypertrophy of a fragment overlooked. [This is certainly remarkable, since it suggests that regeneration of nerve-elements is possible when nutrition in the organ is preserved.] Vitzon now removed the new structure, and blindness was again produced. After a lapse of 4 months the animal gave evidence of the reappearance of vision. The author explains that the sense of vision improved by the presence of the newly-formed elements.

Toxic Amblyopia.—In experiments on dogs,[8] made by De Bono to determine the changes induced by large doses of quinin, there was found marked contraction of the vessels of the optic nerves, and sometimes complete obliteration without traces of inflammation. The fibers of the nerves were always normal. The vascular contraction sometimes involved the vessels of the iris and choroid. Quinin was found in the ocular fluids, from which De Bono infers direct action of the drug on the vessels and on the rods and

[1] Arch. of Ophthal., Jan., 1896.
[2] Ibid., Apr., 1896.
[3] Beit. z. Augenh., pt. xxi., 1895.
[4] Arch. of Ophth., July, 1895.
[5] Klin. Monatsb. f. Augenh., Dec., 1895.
[6] 24th Ophthal. Cong., Heidelberg; Arch. of Ophth., Oct., 1895.
[7] Rec. d'Ophtal., Nov., 1895.
[8] Arch. d'Ottal., vol. ii. fasc. 3-6; ref. Rec. d'Ophtal., Jan., 1896.

PLATE 13.



Medullated retinal nerve-fibers (Arch. of Oph., Apr., 1896).

cones, where its effect is to paralyze. Continuing his experiments, he says that in quinin-amblyopia ischemia of the retina is always present in all cases, whether cured or not. He advises iodid of potassium and frequent paracentesis of the anterior chamber to facilitate the quick interchange of the ocular fluids; later, strychnin.

DeSchweinitz observed that dogs given large doses of salicylic acid or salicylate of soda exhibited amblyopia with blanching of the optic disk and contraction of the vessels, resembling that seen in quinin-amaurosis.[1] Conjunctivitis, corneal haze, and even hypopyon-keratitis, may follow injections of this drug. DeSchweinitz[2] shows the microscopic changes in the visual apparatus in dogs artificially blinded are thickening of the blood-vessel walls, the formation of a clot from thrombosis of the optic-nerve vessels, widening of the infundibulum of the vessels, and atrophy of the nerves, optic chiasm, and optic tracts. Masius[3] observed 2 cases of complete blindness following immediately the administration of 8–10 gr. of the ethereal extract of male fern. He gave the drug to 4 dogs, 2 of which became blind.

A child of 4 years was ordered a large quantity of **quinin**[4] to be taken in many divided doses. The powders were given by mistake in rapid succession and caused a profound sleep. Upon awakening the child was perfectly blind and could not distinguish day from night. The ophthalmoscope showed no lesion. Vision returned after a few days. The most effective treatment, according to DeSchweinitz[5] and Demicheri,[6] is cessation of quinin, inhalation of nitrite of amyl, administration of strychnin, hydrobromic acid, and iodid of potassium.

Cervillo's case[7] was one of absolute central scotoma and postocular neuritis due to **stramonium-poisoning.** The patient was a subject of asthma, and smoked cigarettes of stramonium to relieve the attacks; 6 months after discontinuing the habit he was well.

Darde and Vigor[8] observed a number of cases of amblyopia in a company of 135 men who had partaken of infected **veal.**

A rare form of temporary amblyopia following the use of chocolate, either as a confection or a beverage, is brought forward by Wood.[9] The disease occurred in the person of a physician, whose intelligent observation of his own symptoms removed all doubt as to the connection between the chocolate and the blind-spells.

Hilbert[10] records a case of temporary complete blindness from the ingestion of 45 gr. of **acetanilid.** The nerve and retina were anemic and the visual fields contracted. Vision was restored by inhalations of nitrite of amyl and brandy internally.

[1] Trans. Am. Ophth. Soc., 1895.
[2] The Toxic Amblyopias, 1896.
[3] Bull. d'Acad. Méd. belgique, No. 6, 1895.
[4] Hamlisch, Wien. klin. Rundsch., No. 3, 1895; ref. Rec. d'Ophtal., Oct., 1895.
[5] The Toxic Amblyopias, 1895.
[6] Brit. Med. Jour., Mar., 1896.
[7] Rec. d'Ophtal., July, 1895.
[8] Ibid., Nov., 1895.
[9] N. Y. Med. Rec., Dec. 14, 1895.
[10] Memorabilien, xxxix. Jahrg., pt. 2; N. Am. Pract., Oct., 1895.

Miller and Ring[1] describe a case of acute **lead-poisoning** from absorption of particles of metallic lead through the lungs and skin in a patient who made rag carpets from old window-shades. Under milk diet, potassium iodid, and strychnin the vision improved to O. D. $\frac{20}{70}$, O. S. $\frac{5}{200}$, leaving partially atrophic disks.

Reiner[2] reports at some length another instance of toxic amblyopia from the fumes of **carbon bisulphid.**

Barrett[3] comments on the cases of 2 brothers with central color scotomata and gradual failure of sight from optic neuritis, without history other than that each smoked a moderate amount of strong **tobacco.** There was no evidence in either case of intracranial disease.

Brunner[4] refers to a man of exemplary habits who suffered from positive central scotoma in each eye without assignable cause. The scotoma of the one eye grew smaller under treatment, while at the same time that in the other eye enlarged, to disappear later. Mercury and iodid made up the treatment. The condition seemed to be a retrobulbar neuritis or a papillomacular neuritis, hemorrhagic in character and possibly due to **excessive use of the eyes.**

Darier[5] claims to have cured a well-marked case of retrobulbar neuritis, with absolute central scotoma and loss of sensation of that part of the skin supplied by the infraorbital nerve, by subconjunctival injections of 1 : 5000 bichlorid of mercury.

Heinzel[6] adds to his previous report 3 new cases of **amblyopia occurring during lactation.**

Syphilitic Optic Neuritis.—Januszkiewicz[7] divides specific optic-nerve affections into inflammatory and noninflammatory. His study of 150 specific affections of the optic nerve in Hirschberg's clinic, in reference to the interval between infection and the appearance of nerve-trouble, shows that, in general, inflammations follow in about 1 to 5 years, while noninflammatory degenerations appear in from 5 to 10 years after infection.

According to Zimmerman,[8] acute **rheumatic neuritis** is characterized by sudden onset, is monocular, and follows previous exposure to cold. There is typical papillitis, ending with white atrophy, contracted or dilated pupil unchanged by direct action of light, but responsive consensually and with accommodation. [Zimmerman's case and others show that doubts as to the existence of a rheumatic neuritis should be discarded; 2 cases under our treatment had undoubted rheumatic neuritis and lost all light-perception. One case recovered vision after salivation, the other after bleeding at the arm.]

Highet[9] has met with another instance of acute monocular optic neuritis due to **gonorrheal infection.** No other cause could be assigned. Vision, which fell to $\frac{1}{7}$, with indentation of the fields for red and green, returned to

[1] Am. Jour. of Med. Sci., Feb., 1896.
[2] Klin. Monatsb. f. Augenh., Mar., 1896.
[3] Austral. Med. Jour., Nov., 1895.
[4] Univ. Med. Mag., Oct., 1895.
[5] La Clin. Ophtal., Apr., 1896.
[6] Beit. z. Augenh., xxl.
[7] Centralbl. f. prakt. Augenh., Dec., 1895.
[8] Arch. of Ophth., Jan., 1896.
[9] Ann. d'Oculist., Jan., 1896.

normal under rest, atropin, and the internal use of potassium iodid. Reiss[1] quotes an analogous case, but without recovery. [Inasmuch as rheumatism is often a concomitant of gonorrhea, it would seem that the cases just cited are more or less closely allied in etiology to the preceding ones.]

Neuritis of Intracranial Origin.—Parinaud[2] adheres to his theory, published in 1879, that papillitis of intracranial origin is not due to increased intracranial pressure (Schmidt and Manz), nor to microbic invasion (Deutschmann), but to an edema of the nerve-trunk similar to edema of the brain-tissue: the later inflammation of the retina, common in a neuritis of the trunk, is caused by the presence in the nerve of extraneous material. It is most frequently united with hydrocephalus and increase of intracranial tension, but it does not necessarily imply dropsy of the ventricles. On the other hand, excess of intracranial tension alone is incapable of producing papillary edema. Edema of the nerve does not require any considerable excess of intracranial tension nor mechanical damming up of fluids in the nerve. The intervaginal overflow is a concomitant phenomenon not bearing the relation of cause and effect with a neuritis that could be produced just as well if the intervaginal space did not exist. The scleral ring favors strangulation of the papilla. The external sheath, on the contrary, plays relatively a protective role much as a pressure-bandage. He proposes to call the neuritis of intracranial origin **"edematous neuritis."**

Roghon-Durignaud[3] demurs to Deutschmann's microbe-theory, and, with Schmidt, believes that papillitis is essentially an edema of the optic nerve-sheath due to migration of the cerebrospinal liquid, and not an edema by lymph-stasis in the nerve and brain. Edema of the nerve and retrobulbar subarachnoid space is similar to edema of the limbs from cardiac or renal causes, because circulatory troubles show from the first. If the cause persists, edema may creep up backward as far as the chiasm. The scleral ring, and in less degree the optic canal, are constrictors, and it is this which determines the papillary involvement in the dilatation of the optic sheath between the intracranial region and the globe. He recommends incision into the sheath or trephining the skull in papillitis of cerebral origin, without regard to the site of the lesion, accomplishing by this means drainage.

Adamkiewicz offers another theory.[4] It is generally believed that the intracranial fluid is forced by the presence of the tumor down the intervaginal sheath of the optic nerve, and by compressing the central vein of the retina causes a stasis, the consequences of which are tumefaction of the papilla and edema of the sheath of the nerve. But the optic nerve is compressible, and the fluid can pass into the veins without compressing them. The central vein communicates, through the superior ophthalmic vein, with the veins of the face; it is surrounded with capillaries and is situated in the center of the nerve, and is less influenced by pressure than a number of other veins which are in free communication with the veins of the cranial cavity. By experi-

[1] N. Orl. M. and S. Jour., May, 1896. [2] Ann. d'Oculist., July, 1895.
[3] Arch. d'Ophtal., July, 1896. [4] Zeit. f. klin. Med., 1895; Rec. d'Ophtal., Oct., 1895.

mental increase of pressure in the brain there is stasis of the choroidal veins, but no alteration of the central retinal vein; further, inflammation of the cerebrum and meninges, experimentally produced, does not induce papillary stasis. The author concludes that the stasis is the result of a neuroparalytic optic neuritis analogous to the trophic troubles which are provoked in the eyes of animals by pressure on the occipital lobe.

Elschnig's[1] studies seem to substantiate **Leber's theory** that choked disk arises from an irritation growing out of the presence in the cerebrospinal fluid of noxious elements (toxins introduced by intracranial tumors or inflammations).

Optic Atrophy.—The effects of **lightning** on the eye are not limited to any one ocular tissue. There were partial opacity of the lens, disturbance of the retinal circulation, and inflammation of the nerve in the case recorded by Rohmer.[2] Double optic atrophy was the sequel. Unless there is spontaneous tendency toward cure treatment is of no avail.

Nettleship[3] considers **blindness after head-injuries** to be nearly always permanent, because of optic atrophy. When recovery ensues it is probable that the damage has been caused by effusion of blood into the sheath-space of the optic nerve, rather than by injury to the nerve itself.

From a study of published cases Agella[4] concludes that **fractures** of the anterior section of the base, more than those at the posterior section, are accompanied by paralysis of the optic nerve on the same or opposite side. The nerve is lacerated or torn by rupture of the anterior clinoid processes.

Dombrowski[5] observed **optic atrophy consecutive to carcinoma** of the sphenoid sinus. The affection of the nerve appeared early in the disease, and had proceeded to almost complete atrophy by the time a positive diagnosis had been reached.

A rare history of **atrophy** of the optic nerves as **a sequel to severe hemorrhage** from the stomach is related by Weeks.[6]

Traumatic Atrophy.—The optic nerve was completely destroyed in a patient of Priestly Smith[7] by the penetration of a small rod that entered the orbit through the inner angle of the upper lid. Atrophy ensued.

Embolus.—An embolus, just back of the lamina cribrosa, in a sudden bend of the artery was found by Marple[8] in several of a series of well-prepared microscopic sections. The loss of vision was complete and was followed by glaucoma.

Therapy of Optic Atrophy.—In treatment of double scotoma due to exposure to the direct rays of the sun Sous[9] injected daily-increasing doses of strychnin sulphate into the temples, and vision became normal on the eighth day. Culbertson[10] reports fully 2 cases of optic atrophy in which,

[1] Arch. f. Ophthal., No. 2, 1895.
[2] Rec. d'Ophtal., Nov., 1895.
[3] Ophth. Rev., xiv. No. 162.
[4] Ann. d'Oculist., June, 1895.
[5] Am. Jour. of Ophth., Aug., 1895.
[6] Am. Med.-Surg. Bull., Mar. 7, 1896.
[7] Brit. Med. Jour., Apr. 4, 1896.
[8] N. Y. Polyclinic, Nov. 15, 1895.
[9] Rec. d'Ophtal., Nov., 1895; Jour. de Méd. de Bordeaux.
[10] Am. Jour. Ophth., June, 1896.

after strychnin had produced only partial benefit, nitroglycerin in doses of $\frac{1}{100}$ to $\frac{1}{150}$ gr. twice daily effected marked improvement in vision. He observes that strychnin frequently induces contraction of the retinal vessels, the very condition of the arteries that often determines the diagnosis. This arterial constriction is nicely met with nitroglycerin, which by its vasodilator action affords the strychnin a much better chance to exert its peculiar effect. It is to this latter fact that the author attributes the favorable influence of nitroglycerin in optic atrophy. [We do not know whether Culbertson's theory can be accepted, but clinically we can substantiate him, for we have several times noted, after the use of nitroglycerin, no little gain in vision in incipient atrophies and also toxic amblyopias, when strychnin was partially or wholly inoperative.]

Tumors.—Ring[1] reports an alveolar sarcoma or carcinoma of the optic nerve in a woman of 47, whose eye on the same side had been removed 1 year previously on account of a painful phthisis bulbi. In all probability the growth originated from the optic nerve-sheath, the inclusion of the nerve being secondary. Weigmann's[2] case occurred in a 5-year-old child otherwise perfectly healthy. The condition manifested itself subjectively by headache and pain on attempts at moving the eye; objectively, by exophthalmos and relative immobility of the globe. The microscopic examination showed a primary tumor of the optic nerve.

Instruments.—Henry[3] has devised a photometer by means of which he gains important information as to the relative light-perception in diseased conditions of the optic nerve, retina, and choroid. In healthy eyes this power begins to decline after 30 years, particularly in hyperopia. It is most diminished in diseases that affect the retina. In albuminuria and diabetes the prognosis is seriously affected by diminution of the power of light-perception.

DISEASES OF THE LENS AND CAPSULE.

Etiology of Cataract.—Baker[4] interrogates all the organs in cases of incipient cataract, corrects all optical defects, and resorts to such general and local treatment as may be indicated. He believes there is a nephritic as well as a diabetic cataract. Myopia and glaucoma have long been recognized as local causes. Stillson[5] fully agrees with Baker. Hess[6] classifies the causes thus: (1) In senile cataract local and constitutional causes are factors; (2) Diabetes is regarded as a typical constitutional cause, since it is not demonstrated that the small amount of sugar in the aqueous and vitreous can account for it; and, like (3) The naphthalin cataract, it is caused by nutritive disturbances; (4) Rarer forms following tetanus, malarial fever, meningitis, syphilis, typhoid fever, lactation and pregnancy, and the use of ergot; Dufour[7] adds to this list influenza, nephritis, and, in children, rachitis and pertussis; (5) Congenital,

[1] Arch. of Ophth., Jan., 1896.
[2] Klin. Monatsb. f. Augenh., Aug., 1895.
[3] Ophth. Rev., Feb., 1896.
[4] Jour. Am. Med. Assoc., xxv. 649.
[5] Ibid., Jan. 25, 1896.
[6] Ophth. Rev., Apr., 1896.
[7] Am. Med.-Surg. Bull., May 23, 1896.

due to prenatal diathesis and associated with convulsions, ill-developed teeth, skull, and brain; (6) Choroidal cataract, found in diseases of the uveal tract and in anemia and marasmus, for which the name "starvation cataract" has been suggested; (7) Complicated cataract after inflammations, such as iridochoroiditis, from syphilism, rheumatism, or gout. Hess[1] maintains that every opacity in the lens not traumatic or congenital must find its explanation in some reduction of the body-nutrition. Heredity is mentioned as predisposing to cataract-formation.

Diagnosis of Cataract.—[Estimation of the light-sense as a means of determining the functional activity of the retina and nerve in cases of cataract ready for operation has been employed many years.] Katz[2] offers a refinement of the method. In a thoroughly darkened room a normal eye is closed and light is thrown from a distance of 1 m. With this light held steadily on the eye another light is projected on the closed lid from a distance of 5 m. This is the greatest distance at which any difference can be noted when the second light is covered and uncovered, and forms the standard of measurement. In cloudiness of the media, if the optic nerve be intact the open eye will perceive the same difference when the second light at 5 m. is exposed and covered as is found in the normal eye. If, however, there be any impairment in the function of the optic nerve, the second light must be brought much closer before any difference is noted, and the degree in which the second light must be approximated is the measure of the disability of the optic nerve. Segual[3] has noticed that the pupillary reaction is greater in cataractous than in normal eyes, because the opaque lens diffuses the light over the entire retina.

Extraction of Cataract.—Weeks[4] believes that all cataractous lenses in individuals 25 or more years of age can be removed with comparative safety, and that the most favorable time for the extraction is when the lens-fibers have become separated from the lens-capsule by the formation of liquor Morgagni. He disapproves, accordingly, of Foerster's preliminary iridectomy, preferring simple extraction and removing cortical substance by external manipulation. Derby[5] believes the chances of success in cataract-operation between 80 and 90 years are generally underestimated. Bettmann[6] also prefers the simple extraction. He follows De Wecker's custom[7] in not using eserin, and claims that the results are correspondingly better, and that the use of atropin, eserin, or cocain does not affect the occurrence of prolapsed iris. Nanavatty[8] operates with iridectomy while the pupil is contracted with eserin. To him the ideal operation is extraction of the lens in its capsule, without loss of vitreous, through an intact pupil. Wood[9] discountenances irrigation of the anterior chamber after extraction. He always removes the bandage 24

[1] Samml. 3, Abhand. u. d. Gebiete d. Augenh,, H. 2, 1896.
[2] Klin. Monatsb. f. Augenh., Nov., 1895.
[3] Arch. d'Ophtal., July, 1895.
[4] Jour. Am. Med. Assoc., Oct. 19, 1895.
[5] Internat. Med. Mag., Dec., 1895.
[6] Jour. Am. Med. Assoc., Sept. 7, 1895.
[7] Ann. d'Oculist., June, 1894.
[8] Indian Med. Rec., Aug. 16, 1895.
[9] Therap. Gaz., Feb. 15, 1896.

hours after operation. He feels that immediately after extraction the patient ought to be able to count fingers and *tell time by the watch.* [An unwarrantable procedure, the latter.] Williams[1] recommends a conjunctival suture (employed by his father in 1867), instead of a corneal suture, after extraction, because of quicker healing and less danger of prolapse of the iris. Burnett[2] regards the presence of the capsule in the eye after the removal of the lens as a potent factor in postoperative troubles, and refers 90% of the inflammation, in the iris particularly, to that cause.

Causes of Failure.—Wheelock[3] and Rohmer[4] attribute failure of the operation in many cases to general atheroma of the vessels, and particularly those of the retina. Widmark[5] believes that a faultily-placed incision is the true cause of the keratitis following extraction.

Dressing.—Polyokoff[6] applies immediately after operation a simple starch dressing.

Ellis[7] calls attention to the **rapid ripening** of senile cataracts in some patients. He cites 3 cases in which lenses that had but few streaks of opacity became entirely opaque in less than a week. There was no reason for this sudden change that could be detected before or after extraction. Allport[8] brings forward the unique case of a woman 51 years old, who presented two **nonprogressive,** well-authenticated **hard cataracts** of 25 years' standing, with vision in O. D. of $\frac{20}{200}$, and in O. S. of $\frac{5}{200}$: 21 years previously hard cataract had been diagnosed by Dr. Knapp. With +.75 sph. she did near-work comfortably with her right eye.

Secondary Cataract.—Wickerkiewicz[9] considers secondary cataract operations as serious as the primary.

Postoperative Conditions and Accidents.—Baiaradi[10] finds astigmatism after cataract often dependent upon the method of operation. It is higher in extraction without iridectomy. Anterior synechiæ and prolapse of iris are main causes. Elsberg[11] pictures the insufficient results in discission of secondary cataract, and warns against the pernicious effects on the uveal tract induced by the immoderate use of the needle. He extols highly the extraction of a bit of the capsule by the use of the pincet-scissors, and claims that it is the operation of election. A disastrous result of needling for soft cataract is recorded by Lidbretter.[12] The eye was lost from purulent inflammation. The right eye, on which the same operation had been previously performed with good result, sympathized, and vision was reduced to counting fingers. Enucleation of the left immediately relieved the inflammatory symptoms. According to Rohmer,[13] the general arterial tension is nearly always exaggerated in arterial sclerosis, owing to hypertrophy of the heart.

[1] Boston M. and S. Jour., Apr. 16, 1896.
[2] Va. Med. Monthly, vol. xxii. p. 376, 1895.
[3] Fort Wayne Med. Mag., Aug., 1895.
[4] Arch. d'Ophtal., Aug., 1895.
[5] Centralbl. f. Augenh., Jan., 1896.
[6] Ann. d'Oculist., Nov., 1895.
[7] Boston M. and S. Jour., Dec. 5, 1895.
[8] Am. Jour. Ophth., Feb., 1896.
[9] Arch. d'Ophtal., July, 1895.
[10] Ann. d'Oculist., June, 1895.
[11] Klin. Monatsb. f. Augenh., Aug., 1895.
[12] Ann. of Ophth. and Otol., Oct., 1895.
[13] Loc. cit.

The *hemorrhage* is at first in the choroid, causing separation of that membrane from the sclera and then from the retina. Another cause is the anatomic relation of the ciliary vessels to the sclera at their points of perforation, where they are held as if by bone, and, having ruptured, there is no chance to retract, and blood escapes into the interior of the globe. Noyes'[1] views are nearly identical. He adds that in cases of high myopia the liability to hemorrhage is greater on account of the fluidity of the vitreous. If the pupil refuses to dilate under atropin, it is because the iris is atrophic. This is an indication for iridectomy. Spaulding[2] also attributes the hemorrhage to sclerosis of the choroidal vessels. Taylor[3] does not hesitate to extract immature cataracts which interfere with vision in persons past middle life, but he is always careful in such cases to facilitate the exit of the lens by a large flap, and to avoid as far as possible the subsequent formation of inflammatory products in the pupillary area by limiting the incision of the capsule, as recommended by Knapp, to the periphery of that membrane.

Congenital Dislocation.—Sous[4] examined a brother and sister with symmetric dislocation of the lenses. Tiffany[5] records a family history of congenital displacement of the lens. Of 9 children, 7 were affected. Lindner's[6] case of ectopia lentis was bilateral and was associated with ectopia of the pupil. Iridectomy with extraction of the lenses was successful in restoring useful vision.

Results of Extraction.—In an analysis of 10,000 cataract extractions Wilson[7] finds an average of $\frac{7}{100}\%$ loss of vision. Previous tables have shown practically the same proportion of loss, notwithstanding the use of cocain and antisepsis in the cases enumerated in Wilson's tables. In another paper[8] Wilson says: "From the purely clinic standpoint of cataract surgery it seems impossible, as yet, to demonstrate any great change in operative results due to the introduction of antibacterial measures." Kayser[9] gives the preference to simple extraction, in which he secures one-third greater vision than by the combined method. Story[10] also finds the average visual acuity higher after the simple operation.

DISEASES OF THE CORNEA.

Physiologic experiments on monkeys made by Turner[11] demonstrate that the Gasserian ganglion has no trophic influence on the cornea, and also that the ophthalmic branch of the fifth nerve may be divided and the ganglion extirpated without risking the destruction of the eye.

Keratitis.—The causes of keratitis are various: thus, the vicious evolution of a tooth, Sous;[12] mould, Fuchs;[13] a small wooden splinter, Fuchs[14]

[1] Trans. Am. Ophth. Soc., 1895.
[2] Arch. of Ophth., Jan., 1896.
[3] Lancet, Jan. 16, 1896.
[4] Jour. de Méd. de Bordeaux, Oct. 13, 1895.
[5] Jour. Am. Med. Assoc., Nov. 9, 1895.
[6] Wien. med. Woch., Sept. 7, 1895.
[7] Trans. Am. Ophth. Soc., 1895.
[8] Med. Rec., N. Y., May 30, 1896.
[9] Centralbl. f. prak. Augenh., Jan., 1896.
[10] Dublin J. M. Sc., July, 1895.
[11] Abst. Rec. d'Ophtal., Mar., 1896.
[12] Arch. d'Ophtal., June, 1895.
[13] Rec. d'Ophtal., Sept., 1895.
[14] Abst. Pacific Med. Jour., Aug., 1895.

and Mauthner;[1] traumatism during forceps-delivery, Noyes;[2] pronounced proptosis in exophthalmic goiter, Jessup;[3] tuberculosis, Giglio;[4] influenza, Trantas.[5] According to Randolph,[6] **oyster-shucker's keratitis** is a traumatic infiltration of the cornea, nonvascular, circumscribed, and leaving permanent cicatrices. It is caused by decomposition of the shell lodged in the cornea. There is no specific organism.

Filamentous keratitis, according to Sourdille,[7] is slow in development, subject to relapse, painful, and characterized by long slender excrescences analogous to filaments of twisted silk. In the treatment atropin and cocain should be avoided, and the pedicle of the filament scraped off, a compression bandage worn, and internally quinin and tonics administered.

Interstitial Keratitis.—Trousseau[8] and Trantas[9] believe that interstitial keratitis from *acquired* syphilis is not so rare as is generally supposed. Its course is milder than the hereditary form, shorter in duration, and usually limited to one eye, although these differences are not invariably found. It appears most frequently in the second year after infection, although Trantas' case occurred 13 years after the primary disease. From a clinical study of interstitial keratitis, Cook[10] considers that in the majority of cases this affection of the deeper layers of the cornea is secondary to inflammation of the anterior part of the uveal tract; also that it is due to congenital syphilis. [But we find so many exceptional cases that we are inclined to believe that there must be other causes.] Von Hippel[11] agrees in the main with these views. The etiology, he says, is not well defined, but that hereditary syphilis is undoubtedly the usual origin.

A patient seen by Dunn[12] suffered for several weeks with interstitial keratitis, accompanied with intense photophobia. **Menstruation** was established unexpectedly during the treatment, and the photophobia suddenly disappeared. The corneas cleared only partially.

Denig[13] refers to an interesting case of parenchymatous clouding of the cornea following **lightning-stroke** in a girl 11 years old. There was present almost complete amblyopia and marked blepharospasm. After 18 days the cornea had cleared spontaneously, and the patient regained full visual acuity. Chibret[14] asserts that **parenchymatous keratitis** and exudative choroiditis have a common etiology.

Ulcer.—Three conditions, according to Abadie,[15] are necessary for the development of infected ulcer from traumatism. The cornea must be more or less seriously affected, an infectious agent must be present, and this agent must rest for a certain time in contact with the cornea denuded of its epi-

[1] Rec. d'Ophtal., Sept., 1895.
[2] Trans. Am. Ophth. Soc., 1895.
[3] Abst. Pacific Med., Jour., Apr., 1896.
[4] Ann. di Ottal., Ann. ii. vol. ii. fasc. 9, 10.
[5] Arch. d'Ophtal., Nov., 1895.
[6] Trans. Am. Ophth. Soc., 1895.
[7] Thesis of Paris, 1895.
[8] Ann. d'Oculist., Sept., 1895.
[9] Loc. cit.
[10] Jour. Am. Med. Assoc., Mar. 7, 1896.
[11] Arch. f. Ophth., pt. 2, 1896, vol. xlii.
[12] Arch. of Ophth., July, 1895.
[13] Münch. med. Woch., Aug. 20, 1895.
[14] Arch. d'Ophtal., July, 1895.
[15] Ann. d'Oculist., Aug., 1895.

thelium. Uhthoff and Axenfeld,[1] as a result of a bacteriologic study of 50 cases of suppurative keratitis, conclude that the pneumococcus is invariably the exciting agent in hypopyon keratitis (see Plate 14). It is claimed by these authors that the lacrimal and nasal passages abound with this particular organism. Wood White[2] has found a 4% solution of common salt, used subconjunctively, quite as effective as the different solutions of corrosive sublimate in the treatment of corneal ulcers.

Treatment.—[From the multiplicity of local remedies recommended the inference is naturally drawn that there is no one that will meet the requirements of every case. Of all the special means employed to check the progress and hasten healing of indolent ulcers, we give the preference to applications of strong solutions of silver nitrate.] Abadie[3] believes the most effective treatment is antiseptic washes, subconjunctival injections, and the galvanocautery. Woods[4] applies to the floor of the ulcer silver nitrate in 30 gr. solution. Duncan[5] opens the anterior chamber at its periphery, and keeps the wound open by inserting a probe daily, or performs the Saemisch operation, or applies the galvanocautery and uses eserin. The Saemisch operation or curetting should include healthy cornea. Sachsalber's[6] experiments in ulcus cornea serpens convince him that any procedure that induces long-continued abolition of the anterior chamber may induce glaucoma, and is therefore to be rejected. Especially does he pronounce against Saemisch's idea of paracentesis if the wound is much exposed to the air. Chibret[7] has abandoned the use of the electromagnet and tincture of iodin, preferring methyl violet. Darier[8] also recommends methyl violet and subconjunctival injections. Gallemaertz[9] relies upon ariol, the successor of iodoform; Heuse[10] upon aristol powder; van der Berg[11] upon tincture iodin; Phillips[12] gives the preference to the actual cautery or touching with pure phenol. He [properly] insists that the systemic conditions are not without influence on the course of the disease. Rogman[13] has found "theoform" better than iodoform, boric acid, and all other dry applications.

Hypopyon.—In cases of hypopyon in interstitial keratitis Null[14] considers the only source of the pus is the canal of Schlemm and the small pericorneal vessels, and not filtration through the cornea from the floor of the ulcer. Alt[15] says on this point: "I have never come across any specimen that would tend to show that pus-cells ever do or can pass through Descemet's membrane into the anterior chamber; their only way lies through the meshes of the ligamentum pectinatum." [In the treatment of purulent ulcer and other forms

[1] Berl. klin. Woch., Nov. 25, 1895.
[2] Birmingh. Med. Rev., Jan., 1896, Middlemore Lecture for 1895.
[3] Rec. d'Ophtal., Mar., 1896.
[4] Presb. Hosp. Rep., Balt., Jan., 1896.
[5] Inter. Med. Jour., Austral., Mar. 20, 1896.
[6] Beit. z. Augenh., Feb., 1896.
[7] Rec. d'Ophtal., Mar., 1896.
[8] Ibid.
[9] Abst. Rec. d'Ophtal., Mar., 1896.
[10] Abst. Am. Jour. Med. Sci., July, 1896.
[11] La Presse méd. Belge, Aug. 11, 1895.
[12] Med. Rec., Aug. 24, 1895.
[13] Ann. d'Oculist., Mar., 1896.
[14] Arch. d'Ophtal., June, 1895.
[15] Am. Jour. Ophth., May–June, 1896.

PLATE 14.



Serpiginous corneal ulcer. The central violet-colored mass is a fibrin plug. The Frankel-Weichselbaum pneumococcus can be seen between the corneal lamellæ (V. Graefe's Archiv, Bd. XLII, 1896, Part I.).

of purulent inflammation of the cornea eserin is used by many clinicians.] Simi[1] approves of it, on the ground that the benefit to the cornea is greater than the disadvantages of the posterior synechiæ which often ensue after its use. [We have had good results by using both eserin and atropin, the former by day and the latter by night. Posterior synechiæ are in this way avoided.]

Wounds.—Müller[2] states that injuries to the globe occur generally to the nasal or upper aspect of the bulbus, exceptionally to the temporal side; the cornea ruptures oftenest in youth, the sclera in old age. The prognosis is much more favorable in corneal than in scleral rupture.

Tumors.—Pfingst[3] saw a recurrent melanosarcoma occurring in a patient 57 years old as the direct result of a traumatism. Two operations produced a complete cure.

Carr's[4] case of **congenital** opacity of the cornea occurred in a child who was perfectly healthy and presented no evidences of syphilis or any other taint. The parents were both exceptionally sound, and conjunctivitis neonatorum was entirely excluded.

Methods of Improving Vision in Cicatricial Conditions.—The 30 keratoplastics of Fuchs[5] were in general disappointing. They were performed in total abolition of vision in parenchymatous keratitis, complete corneal opacity following inflammation, total staphyloma, and keratectosias, and in only 2 cases was the result at all satisfactory when vision was improved to counting fingers at 1.5 m. In no case did the transplanted flap remain clear. In cases of corneal opacity, when the interference with vision is due to dispersion of rays and not to their total absorption, Van Duyse[6] says that iridectomy does not improve, but materially deteriorates, the vision.

Morton[7] takes even a stronger position as to direct **corneal massage** than last year (see the *Year-Book* for 1896). He still uses his own specially devised spoon, and finds his method as efficient as ever. Wittelshöfer[8] is a strong advocate of massage-treatment.

Conical Cornea.—In the surgical treatment of conical cornea Critchett[9] prefers the galvanocautery to all other measures. Recovery is speedy and almost painless, and the final result satisfactory.

THERAPEUTICS.[10]

Subconjunctival Injections.—[The treatment of ocular disease by means of subconjunctival injections of sublimate and other solutions is a matter that is still *sub judice*. It has become less popular, if we may judge

[1] Abst. Arch. d'Ophtal., Nov., 1895.

[2] Ueber Rupture der Corneo-scleral Kapsul durch Stumpfe Verletzung.

[3] Klin. Monatsb. f. Augenh., Aug., 1895.

[4] Jour. Am. Med. Assoc., Nov. 16, 1895.

[5] Wien. med. Woch., No. 45, 1895.

[6] Arch. d'Ophtal., Jan., 1896.

[7] Ann. Ophth. and Otol., Apr., 1896.

[8] Wien. klin. Woch., May 2, 1896.

[9] Practitioner, Nov., 1895.

[10] The space devoted to the subject of Therapeutics is confined to a description of those measures and remedies that are general in their application, and cannot therefore be included in the chapters devoted to the treatment of diseases of any separate part.

by the fewer number of articles written in its favor in 1896 than in 1895. Our own experience with this treatment would not warrant us in recommending it. The favor with which Abadie's suggestions were received is, to us, simply a sad exponent of the inefficiency of whatsoever measure in many inflammations of the deeper structures of the ball.] Schmidt-Rimpler[1] believes it useless in hypopyon-keratitis, diffuse keratitis (parenchymatous), and corneal ulceration [the diseases that were claimed to be most responsive to the procedure]. In iritis and chorioretinitis his results were favorable enough to warrant further trial. In direct and metastatic infection Seggel[2] has had gratifying results. De Wecker[3] claims to cure ulcer of the cornea by large injections of 1 : 2000 solution. In progressive myopia and vitreous opacities De Bourgon[4] found the injections did not clear up the vitreous or arrest the advance of the myopia. Hosch's[5] experience with subconjunctival injections is not especially favorable. When he employs this treatment he injects cyanid instead of the corrosive chlorid. V. Sicher,[6] too, substitutes the cyanid for the sublimate, stating that it possesses all the bactericidal and antiseptic qualities of sublimate, while it produces less irritation of the tissues and less coagulation of albumin. Parisotti[7] claims to have cured 2 cases of beginning panophthalmitis with large injections of bichlorid 1 : 1000.

Other Remedies.—Vian[8] has found **potassium permanganate** useful in affections of microbial origin. He cites 2 cases of purulent ophthalmia cured by the daily application of 10% solution and washing, by the nurse, with 1 : 2000 solution. In abscesses and purulent diseases of the lacrimal apparatus he injects daily a solution of 1 : 100, and obtains rapid cure in all cases. [The tendency of this salt to dissolve the corneal cement must always be borne in mind in applying it to diseases of the eye.] **Pyoktanin,** as an antiseptic, has not proved the efficacious remedy in the hands of Armaignac[9] that Stilling pronounced it. Norsa[10] has employed **pomades of the balsams of Peru** and tolu, 3 : 100, in the treatment of blepharitis, superficial keratitis, nebulæ, superficial and deep corneal ulcers, hypopyon, and dacryocystitis, and is well pleased with their action. He also credits them with a tendency to clear up opaque corneæ. In syphilitic affections Burnham[11] combines daily hypodermic injections of **pilocarpin** with the ordinary mixed treatment, claiming unusual efficiency for it. [For 2 years we have employed this method, and been much gratified with it. Much larger doses of either mercury or iodid can be given with pilocarpin than without it. The increased elimination under pilocarpin renders the cumulative effect of either drug impossible. We are in the habit of ordering diaphoretic measures in connection with the pilocarpin. Careful account of the heart's action should always be

[1] Centralbl. f. prakt. Augenh., Sept., 1895.
[2] Klin. Monatsb. f. Augenh., Nov., 1895.
[3] Arch. d'Ophtal., July, 1895.
[4] Ann. d'Oculist., Oct., 1895.
[5] Rep. Bâle Polyclinic, 1895.
[6] Münch. med. Woch., Dec. 13, 1895.
[7] Abst. in Rec. d'Ophtal., Feb., 1895.
[8] Rec. d'Ophtal., June, 1895.
[9] Arch. d'Ophtal., June, 1895.
[10] Rec. d'Ophtal., Nov., 1895.
[11] Arch. of Ophth., July 1895.

taken before instituting the pilocarpin treatment.] Abadie[1] approves hypodermic injections of 1 % **cyanid of mercury** in place of mercury by the mouth.

Relative Strengths of Mydriatics, etc.—Jackson[2] found that the weakest solutions producing any effect on the pupil were homatropin hydrochlorate, $\frac{1}{30000}$ gr., eserin sulphate $\frac{1}{100000}$ gr., atropin sulphate $\frac{1}{1500000}$ gr., and hyoscyamin hydrochlorate $\frac{1}{3000000}$ gr. Taking homatropin as the unit, the relative strengths of the mydriatics and myotics appears to be—pilocarpin $\frac{1}{4}$, eserin 6, atropin 30, and hyoscyamin 75. Friedenberg[3] reports a case of atropin exanthem extending over the cheek in a girl of 11 whom he was treating for syphilitic iritis.

Chabaneix[4] asserts that **electrolysis,** in feeble current, is the best treatment for stricture of the nasal duct, that it is more efficacious than Bowman's probes employed alone, and that when carefully applied it is not painful.

Arecetin or **arecolin hydrobromate** (probably arcein), isomeric with brucin, obtained from cinchona-bark, is said by Lavagna[5] to possess a myotic action in 1 % solution very energetic, but of short duration. The myosis is complete in 5 minutes, and disappears inside of an hour. Arcein acts on the ciliary muscle, producing a spasm as intense as that of eserin. The author claims reduction of tension in glaucoma after its use. Ohleman[6] found that the pupillary contraction commenced in about 5 minutes, reached its maximum in 10, continued for 20, and vanished in 90 minutes.

The new anesthetic, **"eucain,"** possesses the advantage of not dilating the pupil, and the disadvantage of inducing conjunctival hyperemia (Vinci[8]). As a local anesthetic in all ocular operations excepting those involving the cornea and anterior chamber (where cocain should be used), Bellencoutre[7] recommends, as vastly superior to cocain in destroying sensation, a solution of pure **oil of guaiac,** 1 part to sterilized olive oil 15 parts. The preparation is free from noxious effects. Anesthesia appears in from 8 to 10 minutes after its use and continues 25 to 30 minutes; 2 or 3 drops are sufficient for most operations.

Antipyonin is recommended by Rolland[9] in all forms of conjunctivitis and keratitis, used as a powder insufflated into the sac, and before operations into the nasal cavities. [This is a step in the right direction, and we wish we might see more reference to an attempt at sterilization of the nasal passages before operations on the eye. We believe that neglect of the nasal passages is the source of much postoperative mischief, but accurate knowledge on the subject is not yet at our command.]

[Among the new remedies, none has been so uniformly praised as **formol** (formalin or formaldehyde); 1 : 2000 seems to be the strength most used.] In this strength Lavagna[10] extols it in the treatment of dacryocystitis and as a wash in diseases of the nasal mucous membrane. Barabacheef[11] prefers

[1] Ann. d'Oculist., June, 1895.
[2] Jour. Am. Med. Assoc., Oct., 1895.
[3] Abst. Rec. d'Ophtal., Feb., 1896.
[4] Thèse de Bordeaux, 1895.
[5] Congr. Soc. italienne d'Ophtal.; Ann. d'Oculist., Oct., 1895.
[6] Augenartzliche Therapie, Wiesbaden, 1896.
[7] Jour. de Méd. de Paris, Dec. 22, 1895.
[8] Deutsch. med. Zeit., Apr. 27, 1896.
[9] Rec. d'Ophtal., Oct., 1895.
[10] Arch. d'Ophtal., Aug., 1895.
[11] Le Bull. méd., June 16, 1895.

formol, in the above solution, to all other antiseptics. In the management of corneal ulcers and hypopyon keratitis Davidson[1] commends formol dropped into the eye every hour. Gepner[2] also gives it his hearty endorsement. [Formol has deservedly won its way to recognition. In all forms of purulent keratitis we employ it with greater confidence than can be reposed in any other one drug; 1:2000 solutions used every hour seldom fail to affect an ulcerative keratitis promptly for the better. In purulent conjunctivitis its use in our hands has been less satisfactory.]

For the sterilization of collyria Pagnini[3] relies on a 3% solution of **salicylic acid.** [For this purpose nothing is superior to 1:4000 solution of formol.] In order to preserve the yellow oxid-of-mercury ointment from the decomposing influence of light, Holth[4] uses pure lanolin or yellow vaselin as an excipient, and keeps the ointment in dark containers. Luciani[5] advocates the use of **ichthyol** ointment, 2½ to 10% solution, in the treatment of scrofulous blepharitis. Duclos[6] recommends **fluorol,** 1:100 or 1:200, as an injection into the lacrimal sac and nasal duct in the treatment of dacryocystitis. It is a powerful antiseptic and not painful. In all those conditions of the eye calling for the use of iodoform Hoor[7] gives the preference to **nosophen** (iodol); also when calomel is contraindicated by reason of the internal use of iodin in some form. According to Bates,[8] the effect of instillations of 1% solution of the aqueous extract of the **suprarenal capsule of the sheep** into the conjunctival sac is decidedly astringent, whitening the conjunctiva and sclera, and is not irritating; it is highly extolled in inflammatory conditions and as an aid to cocain before operation. [Our own experience does not warrant its use in inflammatory conditions, but we can endorse Bates's claim that its astringent action is valuable in tenotomy, enucleation, etc.]

THE EYE IN SYSTEMIC DISEASES.

Albuminuric Retinitis of Pregnancy.—Silex[9] finds the ophthalmoscopic picture of renal retinitis and the retinitis of pregnancy quite similar, although in the latter hemorrhages are likely to be more numerous. He believes the amaurosis depends rather on the uremia than upon the edema, and estimates that retinitis occurs once in 3000 pregnancies. The prognosis is worst in contracted kidney, better in acute nephritis, and best in nephritis of pregnancy. Of Silex's cases only those regained normal vision in whom labor was induced. He holds this to be a strong argument for ending the pregnancy. Snell[10] offers the following advice: 1. For retinitis appearing before or about the sixth month induction of labor should be recommended; 2. When it appears only in the last few weeks induction of labor may often be unnecessary, depending upon the severity of each case; 3. A case in which

[1] Brit. Med. Jour., Jan. 18, 1896.
[2] Am. Med.-Surg. Bull., July 15, 1895.
[3] Ann. d'Oculist., Oct., 1895.
[4] Arch. of Ophth., Oct., 1895.
[5] Ann. di Ottal., xxiv.; abst. Arch. d'Ophtal., Feb., 1896.
[6] Arch. clin. de Bordeaux, June, 1895.
[7] Klin. Monatsb. f. Augenh., May, 1896.
[8] N. Y. Med. Jour., May 16, 1894.
[9] Berl. klin. Woch., No. 18, 1895.
[10] Brit. Med. Jour., June 22, 1895.

retinitis shows itself in one pregnancy should be carefully watched, both as to albuminuria and retinitis, in subsequent pregnancies. In young women in whom recurring pregnancies endanger sight the question is raised whether both ovaries should not be removed. Belt's[1] statistics, taken from private practice, on the prognostic value of albuminuric retinitis show that 62% of the cases died within 1 year from the time the retinal trouble was noted; 85% died in 2 years; and 14% lived over that time. Of hospital cases, 85% died within 1 year, 93% in 2 years, and 6% lived over 2 years.

Diabetes.—Among 500 diabetic patients, König[2] found cataract, iritis, ulcer of cornea, keratitis with hypopyon, conjunctivitis, scleritis, tenonitis with chemosis, abscess of lids with gangrene, paralysis of sixth pair, hemorrhagic retinitis with exudation, amblyopia with central scotoma, optic atrophy, homonymous hemianopsia, hemorrhagic glaucoma, limitation of accommodation, ophthalmoplegia externa. Cataract may be safely operated on, provided the patient has been subjected to a dietary course. The grave diseases of the eye are generally followed in a short time by death. Appenzeller[3] found **myopia** of 1.00 D., in connection with an incipient diabetes, that disappeared entirely as the diabetes yielded to treatment. He assumes that the myopia was due to increase of the index of refraction of the aqueous humor.

Hysteria.—The fallacy of the assumption that certain diseases of the eye are hysterical because the diagnosis of organic disease cannot be made from the symptoms is illustrated by Friedenwald.[4] A woman gradually became blind without ophthalmoscopic changes. It was considered by Friedenwald and others (ophthalmic and nerve experts) whom he saw in consultation as hysterical, but the death of the patient some months later showed that she was suffering from organic disease of the brain.

In a youth of 18, Reber[5] cured clonic blepharospasm, at first bilateral, later unilateral, of hysteric origin, by one application of the interrupted galvanic current. He attributes the sudden recovery entirely to the profound psychic effect of the galvanism.

According to Charcot and Parinaud, monocular diplopia in hysteria is always due to spasm of the accommodation. Lagrange[6] asserts that it may have its origin in the brain. His patient was cured by suggestion. A girl of 15 fell on the ice, striking the back part of the head; 4 months later she became entirely blind in the right and partially so in the left eye. No one lesion could be detected, and the diagnosis of hysterical amblyopia, made by Marple,[7] was confirmed by several neurologists. Powers[8] cites a case of hysterical blindness in a married man of 21, who could barely count fingers, but who, after 5 days' treatment with strychnin and potassium iodid, had vision of nearly $\frac{20}{20}$.

Unilateral lacrimation, with limitation of the field on the same side and

[1] Jour. Am. Med. Assoc., Nov. 2, 1895.
[2] Rec. d'Ophtal., Oct., 1895.
[3] Centralbl. f. prakt. Augenh., May, 1896.
[4] Med. News, Feb. 16, 1896.
[5] Ann. Ophth. and Otol., Oct., 1895.
[6] Arch. d'Ophtal., June, 1895.
[7] Am. Med.-Surg. Bull., Nov. 15, 1895.
[8] Pacific Med. Jour., July, 1895.

the alternation of oversecretion and dryness of the conjunctiva, were seen in hysteric subjects by Berger.[1] An extremely nervous woman, aged 42, under the care of Janet,[2] had transient attacks of hemianopsia and persistence of retinal images. Fixation was first on the left side; afterward she perceived the persistent images only on the right or hemianopsic side, and finally they disappeared, showing the hysterical nature of the symptom. Sensibility was diminished on the right side of the body. Badal[3] cured hysterical symptoms by enucleation of an eyeball. [If we understand by hysteria that a microscopic change, as suggested by Seguin, has taken place in the nerve-elements of the brain in some particular centers, this diagnosis may be made, for the history of these cases and other similar ones would preclude the assumption that the blindness is voluntary or in any way subservient to the will of the patients.]

Epilepsy.—The fundus changes in epilepsy are said by Reber[4] not to be characteristic, and do not differ from those observed in low grades of neuroretinitis from eye-strain. The same author[5] says that pupillary inequalities are only of relative importance in epilepsy, and can occupy but a minor position in building up the objective picture of that disorder. Ranney[6] reports in full the details of a case of epilepsy in which, after 3 tenotomies of the interni and the correction of the remaining vertical error with prisms, there was complete cessation of the seizures. The treatment extended over a period of 15 months. At the time of report 1 year had elapsed since the last seizure, whereas she had been averaging 2 to 4 convulsions a month for years.

Incipient General Paralysis and Idiocy.—Among the earliest signs of general paralysis are said by Hepburn[7] to be those pertaining to the eyes. The disk assumes a coppery color, or, while it preserves its normal tint, the fundus seems to be infiltrated by a layer of thin fine stripes of a dark color on which the normal vessels run. The disk whitens more and more and excavates slightly; the vessels diminish in size; the temporal and lower borders of the field are the first to become limited; the muscles are weak, especially the internal rectus; the acuity of vision lessens, although the patient declares he can see better than before; finally, an interstitial neuritis may precede all other symptoms for many years. Altabus[8] finds binocular vision the exception in idiocy. He quotes Guibert as observing squint in 60% of the cases he examined. The squint is nearly always convergent, being associated with hyperopia, but in some cases it is divergent. [The frequent occurrence of squint among epileptics and idiots has been commented on by one of the editors of this department when going through the wards of the State Hospital for the Insane at Norristown, Pa. He has shown, too, that the vast majority of epileptics examined there under mydriasis have hyperopia or hyperopic astigmatism.]

[1] Rec. d'Ophtal., June, 1895.
[2] Arch. d'Neurol., May, 1895.
[3] Arch. d'Ophtal., June, 1895.
[4] Ann. Ophth. and Otol., Apr., 1895.
[5] Med. News, Aug. 24, 1895.
[6] Ann. Ophth. and Otol., Apr., 1896.
[7] Am. Jour. of Insan., Jan., 1895.
[8] Abst. Am. Med.-Surg. Bull., Oct., 1895.

Syringomyelia.—A patient of Vialet,[1] aged 57, had muscular atrophy of the left arm with sensory changes. The left palpebral fissure was smaller than the right, the globe retracted, the left pupil myotic and reacted to light and convergence, the right pupil dilated and reacted to convergence, but not to light.

Myxedema.—The eye-lesions in myxedema are, according to Callan,[2] lacrimation due to swollen lids and an appreciable amount of corneal anesthesia. The usual treatment by thyroid extract increases the arterial pressure, already abnormally high, and perhaps induces disease of the kidney accompanied by albuminuria and retinitis.

Ataxia.—Ocular examination in the early stage of locomotor ataxia[3] should include—1. The interior muscles, as shown by the size of the pupils and their mode of response to light and accommodation; 2. The exterior muscles, including the elevator of the lids; 3. The optic nerve, which is so often affected. [In determining the condition of the latter the examination of the field for form and colors is of the first importance, since limitation of the color-field is one of the earliest signs of atrophy.] Of the 103 cases investigated by Grosz,[4] only 13% possessed full acuity and 12% showed normal eye-grounds. Eyes normal in all respects (vision, eye-ground, field, and color-sense) were found in but 2 cases. Normal pupils occurred in 3%, the color-sense was subnormal in 22%, the optic nerve was affected in 32%, and inequality of the pupils was present in 65%.

Hereditary Ataxia.—The ocular complications of hereditary cerebellar ataxia are, according to Longe,[5] progressive and bilateral papillary atrophy, concentric limitation of the field, dyschromatopsia and achromatopsia, equal pupils, neither contracted nor dilated, responding slowly to light and actively to accommodation; nystagmus, paralysis of the external rectus, essentially transitory, and paralysis of the elevator of the lid. The paralysis is not complete and is under the control of the will.

Disseminated Sclerosis.—The ocular symptoms described by Kunn[6] are—nystagmus, produced by fixation or forced peripheral movement; convergence, with loss of movement of excursion from causes in the central nervous system, and not from refractive or muscular conditions; and, finally, failure of near vision.

Syphilis.—Galezowski's[7] divisions of ocular syphilis are—malformation of the protecting coats, paralysis or spasm of the motor nerves, arrest of development, and alteration of the internal membranes. Syphilis is hereditary in the second and third generations. He mentions a large number of cases, particularly of keratitis and choroiditis, which exactly resemble those of acquired syphilis, in which no trace of the poison could be determined. They recover under mercury.

Holth[8] demonstrates positively the possibility of syphilitic autoinfection.

[1] Rec. d'Ophtal., June, 1895.
[2] Trans. Am. Ophth. Soc., 1895.
[3] Bruner, Med. News, Aug. 3, 1895.
[4] Centralbl. f. prakt. Augenh., June, 1896.
[5] La Presse méd., Oct. 12, 1895.
[6] Rec. d'Ophtal., June, 1896.
[7] Ibid., Jan., 1896.
[8] Arch. of Ophth., Jan., 1896.

A sailor contracted a bad chancre on the penis that he continually nursed. About the same time a foreign body flew into the eye. For a week he frequently rubbed the eye, and in 3 weeks a typical chancre developed on the margin and conjunctival surface of the upper lid.

Eleneff[1] sums up the ocular complications of encephalic syphilis: optic nerve-affections—papillitis, neuritis, atrophy—are the most frequent. Temporal is more common than homonymous hemianopsia. DeSchweinitz[2] states that hemianopsia, while usually a direct symptom, may be only an indirect sign of the disease or a distant symptom, and that it may accurately localize a very small lesion within the cranium when that lesion is itself insignificant, the main cause being quiescent. Eleneff further says paralysis of the third pair is second in frequency to affections of the optic nerve. It may be partial or complete, the former being more frequent in basal lesions. Internal ophthalmoplegia is common in the mental form of syphilis of the brain. Bilateral chronic external ophthalmoplegia of nuclear origin is seldom due to syphilis. Paralysis of some of the branches of the third pair (unilateral or bilateral) can be satisfactorily explained by a syphilitic lesion of the base. Partial ophthalmoplegia, ordinarily unilateral, is extremely frequent in encephalic syphilis. Paralysis of the other motor nerves is more rare than those of the third, among them that of the sixth occupies the first place. Neuroparalytic keratitis is relatively frequent, and is a sequel of lesion of the Gasserian ganglion. The lesions, in the various ocular complications of brain-syphilis, are in the majority of cases at the base. The meninges are usually affected under the form of gummatous meningitis or more or less diffuse sclerosis. Ewetski[3] saw an instance of relapsing amaurosis due, in his opinion, to gumma at the chiasm. The second attack occurred suddenly and continued 3 weeks. It was followed by bitemporal hemianopsia, hippus, and hemiopic pupillary reaction (Wernicke's symptom). Mixed treatment greatly improved the symptoms; 2 years later there was recurrence with all the symptoms of the second attack. Allyn[4] records a case of left bilateral hemianopsia with loss of accommodation and dilatation of the left pupil. He located the lesion in the right tract between the commissure and optic lobe. Six months later the patient became suddenly unconscious, and upon recovery was totally blind. Vision later improved excentrically, but the scotoma always involved the foveal region.

Intracranial Tumors.—Norris[5] says that papillitis is present in 90% of all cases at some stage of the development of intracranial growths; vision is little interfered with in the early stages; tumors may exist a long time without optic neuritis, when suddenly a vascular storm arising from rapid growth or compression of the large sinuses of the brain may cause its appearance. The papillitis of intracranial growths, characterized by great venous vascularity and swelling, presents an entirely different aspect from the anemic

[1] Thesis of Paris, 1895.
[2] Univ. Med. Mag., Mar., 1896.
[3] Centralbl. f. prakt. Augenh., Sept., 1895.
[4] Arch. of Ophth., Apr., 1896.
[5] Univ. Med. Mag., Mar., 1896.

swelling caused by tumors that compress the optic nerves themselves at their passage through the optic foramen. Recurring papillitis in an atrophic disk is very rare, but in these days of trephining is occasionally observed. Norris accords with the opinion that the papillitis is a toxin inflammation.

Convulsions, semiunconsciousness, abolished sensation in the soles of the feet, contraction of both pupils, and nystagmus of the left eye, were noted by Vos[1] as the symptoms of tuberculous meningitis of the left side. Exophthalmos, optic atrophy, paralysis of the 3d, 4th, and 6th nerves, and of the first division of the 5th, severe headache, and death were produced by 3 intracranial gummata—found, postmortem, by Dufour.[2]

Mind-blindness.—Culbertson[3] reports a case of mind-blindness due to cerebral compression, lending color to Swanzy's idea that the center for visual memory lies in the parietooccipital lobe.

Hinselwood[4] reported minutely the results of his examination of a case of **word-blindness.** He calls special attention to the patient's ability to write, but not to read, and on this account believes that there are two centers for perception—that for the intelligent conception for things seen, situated in the posterior convolution of the occipital lobe, and another, which is the center for visual memory, situated in the angular convolution. This patient could recall definitely the shape of any letter shown him; therefore the higher visual memory center was probably not affected.

Optic aphasia accompanying purulent inflammation of the meninges of the left temporal lobe, the latter **the result of a purulent otitis media,** is a complication reported by Jansen.[5] On the fifth day after mastoid trephining his patient named objects, and finally recovered. Urbantschitsch[6] observed nystagmus and dilated pupil caused by ear-disease, and cured when the cause was removed.

Benson[7] records an extraordinary case of **acromegaly** with eye-symptoms. The ocular complications differed from those hitherto reported: 1. The early appearance of central scotoma for colors and probably also hemianopsia for colors; 2. The almost complete recovery of vision which followed the use of potassium iodid and the cessation of tobacco; 3. The return of visual troubles after more than 2 years when the use of tobacco was resumed; 4. The rapid deterioration of vision which occurred when thyroid tablets were first used; 5. The rapid and continued improvement which followed the use of the fresh thyroid extract; 6. The many and peculiar changes which have occurred in the visual field.

Teeth.—The necessity of examining into the condition of the teeth in ocular inflammation is illustrated by 3 cases of Fouchet.[8] The first, of corneal and superciliary cutaneous herpes, seems to have been unquestionably dependent on dental irritation, as all the vesicles subsided in 24 hours after the

[1] Brit. Med. Jour., Feb. 1, 1896.
[2] Jour. Am. Med. Assoc., Jan., 1896.
[3] Am. Jour. Ophth., Mar., 1896.
[4] Lancet, Dec. 31, 1895.
[5] Berl. klin. Woch., Sept. 2, 1895.
[6] Rec. d'Ophtal., Mar., 1896.
[7] Dublin J. M. Sci., Nov., 1895.
[8] Ann. Ophth. and Otol., Oct., 1895.

removal of a decaying molar. The third case was a girl of 21 with monocular optic neuritis and amblyopia. Finally, after extraction of a wisdom tooth while under treatment with mercurial inunction and potassium iodid, vision became $\frac{5}{5}$. [The question remains open whether the removal of the tooth or specific treatment procured the result.] Panas[1] observed a case of blindness, followed by death, from purulent meningitis, secondary to dental caries. The inflammation extended to the maxillary sinus, then perforated the orbital wall, causing orbital phlegmon, and extended into the cranial cavity. The pus found in the cranial cavity contained the streptococcus. Death was probably due to the accompanying erysipelas. Péchin[2] adds testimony to that already in evidence of the serious effect of decayed teeth on the ocular apparatus.

Gout.—The subject of gouty eye-diseases is enriched by a contribution from the pen of Jonathan Hutchinson.[3] They occur intermittently, often once a year, are very painful, but subside completely after a time. The subjects are usually adult men, who, though not liable to podagra, have suffered from sciatica and the like. Aconite, colchicum, opium, and alkalies and liberal counter-irritation are the remedies. A somewhat peculiar form of destructive iritis, usually symmetrical, is occasionally met with in women who inherit gouty tendencies and have arrived at the climacteric period. It is sometimes almost painless. In men, the subjects of acquired gout, we sometimes see acute and very painful ulceration of the margin of the cornea of a definitely gouty nature, and curable by treatment suited to that diagnosis. Women are not wholly exempt.

Under the name of sclerotitis we recognize certain cases almost always associated with arthritis, and often with gonorrheal rheumatism, in which the whole eyeball, as regards its subconjunctival tissue and sclerotic, is congested. There is much irritation and pain. Occasionally the iris is implicated, but the attacks are not, as a rule, attended with danger to the organ. The term "hot eye" is applied to certain cases of temporary congestion of the eye, often quite transitory, to which the gouty are liable. The "hot eye" frequently occurs in direct connection with articles of diet.

Nasal Disease.—Alt's case[4] of optic neuritis consequent upon cauterization of the turbinated bones is not without interest and warning. Alt unearthed a history of syphilis, and believes this established a vulnerability that by reflex excitement from the cauterization developed into a full-blown optic neuritis. [We have now under observation a young woman with large central scotoma in the right eye consecutive to an operation for deviated septum. The blind spot is gradually disappearing.] Laurent[5] has noticed ocular pain and lacrimation as symptoms of nasal disease. Hansell[6] referred

[1] La France méd., 1895, xii. p. 168; abst. Am. Med.-Surg. Bull., Aug. 1, 1895.
[2] Arch. d'Ophtal., May, 1896.
[3] Arch. of Surg., July, 1895; abst. in Ann. of Ophth. and Otol., Oct., 1895.
[4] Am. Jour. Ophth., Sept., 1895. [5] Abst. Rec. d'Ophtal., Mar., 1896.
[6] Phila. Polyclinic, May 23, 1896.

acute double optic atrophy in a young man to purulent disease of the ethmoid and sphenoid cavities. In speaking of the ocular symptoms of disease of the mucous cavities of the head, Péchin [1] says: "In some cases the terms 'reflex phenomena' and 'infection' may be connected, but are not inseparable; and in others the reflex phenomena may be the initial symptom of the infection and an inseparable function of it."

Typhus Fever.—In bilateral metastatic ophthalmia following typhus fever Gasparrini [2] seems to prove the necessity for the intervention of the bacillus coli in the production of the ocular and other complications. Toxins of the cultures inoculated in the eye of the rabbit provoked lesions of the uveal tract and of the retina, particularly near the ora serrata.

Measles.—Raymond [3] saw bilateral external ophthalmoplegia and right hemiplegia following measles.

Tubercle.—Valude [4] describes a case of tubercular fungus in an infant, exhibiting swollen lids, chemotic conjunctiva, abundant mucopurulent discharge, pupillary occlusion, and abolition of the anterior chamber; 5 mm. below the cornea was a cavity large enough to permit the introduction of the extremity of the little finger, encircled by red, exuberant fungous borders, filled with pus and communicating with the interior of the globe. The child had congenital abnormalities.

Scorbutus.—Denig [5] reports the following rare condition found in the eye of a scorbutic who was confined to his bed 8 weeks: Papillary edema, narrowed arteries, enlarged veins, numerous hemorrhages along the vessels, and whitish areas about the nerve-head and macula independent of the blood-vessels: 7 weeks later there remained but a trifling edema of the nerve-head and vision was good.

Cirrhosis of the Liver.—Denig [6] observed well-marked venous stasis, narrow arteries, and abundant small hemorrhages along the veins. Icterus was not present. The author attributes the fundus alterations to endarteritis frequently found associated with the arterial changes in the cirrhotic liver. Seabrook [7] calls attention to the importance of interrogating the hepatic functions in ocular disorders of obscure origin, detailing illustrative case-histories.

Diphtheria.—Denig [8] cites an instance of postdiphtheric paralysis of the external recti in a 6-year-old girl. The ciliary muscles and the irides were intact and the eye-grounds normal; 6 weeks later full recovery ensued.

Graves' Disease.—A case of exophthalmic goiter, reported by Friedenberg,[9] is interesting from the fact that the exophthalmos was unilateral, and that the opposite lobe only of the thyroid gland was affected.

SERIOUS INJURIES OF THE GLOBE.

Foreign Bodies.—Hilbert [10] observed a foreign body that had remained

[1] Rec. d'Ophtal., June, 1896.
[2] Abst. Rec. d'Ophtal., Jan., 1896.
[3] Gaz. Heb. de Méd. et Chir., Jan. 5, 1896.
[4] Rec. d'Ophtal., Jan., 1896.
[5] Münch. med. Woch., Sept. 3, 1895.
[6] Ibid.
[7] N. Y. Med. Jour., May 14, 1896.
[8] Münch. med. Woch., Aug. 27, 1895.
[9] Arch. f. Ophth., Bd. xli. Abt. iii., 1895.
[10] Klin. Monatsb. f. Augenh., Aug., 1895.

imbedded in the cornea for 18 months without producing irritative symptoms. After removal it was found to be a minute bug 1½ mm. in length. Healing of the ulcer was rapid. Jocqs and Fourgs[1] discovered in an eye, enucleated on account of inflammation, a piece of cartridge that had remained in it for the unprecedented period of 40 years.

Wounds.—DeWecker[2] recommends suturing the conjunctiva across the cornea in wounds of the latter. It never becomes united to the living cornea. Vossius[3] sutured the cornea in 3 cases of penetrating wound with entirely satisfactory results.

Removal of Foreign Bodies.—[In the majority of cases the retention of a foreign body in the interior of the ball entails loss of vision and often sympathetic inflammation. The laceration of the tissues and the results of concussion, such as clouding of the lens, detachment of the retina, and rupture of the uveal tract, and the repair process itself, vitiate or destroy function. There are fortunate exceptions to this rule.] Thus, Oliver[4] by the prompt, and Rosenmeyer[5] by the late, use of the magnet restored useful vision. The former advises immediate operation. [It is our experience that delay in the extraction of a foreign body is practically synonymous with loss of sight, and that the magnet to be useful must be employed at once.] Heckel[6] removed, with recovery of vision, a piece of steel and the underlying iris. Holt[7] approves of the use of the magnet in extracting foreign bodies from the vitreous, even if they cannot be precisely located, provided the lesion from the injury is severe enough to cause destruction of vision. Rohmer[8] coincides with this view. He insists that it shall be used at the earliest possible moment, since purulent disease is known to have followed in 2 hours after the introduction of a foreign body into the vitreous. Schmidt-Rimpler[9] prefers Haab's strong magnet for locating and extracting splinters that are hidden in the eye, but when the metal can be seen he prefers Hirschberg's. This is also Hirschberg's own view.[10]

When foreign bodies are small enough to be imbedded in the lens the danger of extraction of the lens is greater than extraction for other traumatic cataracts. Risley[11] warns against the danger of allowing the body to fall back into the eye upon the ciliary region. If it causes no other disturbance than opacity, and if the fellow-eye is good, he advises that it be let alone.

Jackson and Schneideman[12] have decided that in **injury to the crystalline lens,** perforation of the capsule, and disturbance of lens-substance may be followed in the human eye, as in the eyes of lower animals, by permanent healing without opacity, or with opacity strictly and permanently limited to the part directly injured; and this may occur in the adult up to middle life.

[1] La clin. Ophtal., Sept., 1895.
[2] Arch. d'Ophtal., June, 1895.
[3] Beit. z. Augenh., Feb., 1896.
[4] Will's Hosp. Rep., vol. i. No. 1, 1895.
[5] Centralbl. f. prakt. Augenh., Aug., 1895.
[6] Arch. of Ophth., Oct., 1895.
[7] Trans. Am. Ophth. Soc., 1895.
[8] Ann. d'Oculist., Mar., 1896.
[9] Berl. klin. Woch., Oct. 7, 1895.
[10] Ibid., June 22, 1896.
[11] Med. News, Apr. 11, 1896.
[12] Will's Hosp. Rep., vol. i. No. 1, 1895.

Ovio[1] shows by chemic and experimental observation that grains of **lead** in themselves are innocuous, on account of their round form, smooth surface, slight chemic reaction, and aseptic condition at the moment of explosion. That the retention of **glass** is not incompatible with useful vision is shown by Marshall.[2] Corr[3] enucleated an eye that had been injured 3 years previously by an imperfect sky-rocket. At the autopsy a piece of **bone** $\frac{3}{8}$ in. long and $\frac{1}{16}$ in. wide, a portion of the infraorbital margin, was found.

Spontaneous protrusion of a foreign body from the anterior chamber is a rare and fortunate termination of a severe injury. Hansell[4] reports such a case. Armaignac[5] observed the spontaneous extrusion of a piece of **copper wire** that had been resting in an eye for 4 months. Lagrange[6] considers copper less damaging to the eye than other metals, while Leber[7] believes it to be the most noxious of foreign bodies that enter the eye. Badal[8] noticed that grains of **shot** that pass entirely through the eye make the wound of exit exactly similar to the wound of entrance.

The first report of the practical application of the use of the **Röntgen ray** in eye-surgery is made by van Duyse,[9] who detected a grain of lead invisible to the ophthalmoscope. [For Harnisch's investigations with the Röntgen process see section on New Instruments.] Darien[10] finds the ocular media but slightly permeable to the Röntgen rays, and that it is possible that this may be one of the factors of their invisibility.

Rupture.—Fage[11] explains the mechanism of **rupture of the coats** of the ball by the fact that the ball is held between two resisting forces—namely, the wall of the orbit on the one side and the attachments of the optic nerve on the other. Between these two forces the distensible tender membranes rupture perpendicularly to the line of the force.

Tetanus.—Fromaget and Cabannas[12] observed a case in which, 8 days after a penetrating wound of the eye, tetanus of the muscles of the jaw developed, followed by general muscular spasms. The remains of the original eye were enucleated without effect on the tetanus; death followed.

A case of **extensive laceration** of the eyeball, reported by DeSchweinitz,[13] illustrates how we are sometimes happily disappointed by the recovery of an apparently hopelessly injured eye and its restoration to almost complete function. Oliver[14] refers to an injured eye operated on with the electromagnet, which he had observed for 5 years, and which, with the exception of a cataractous lens that could be removed at any time, was perfectly healthy and quiet.

Relative Injuries and Values of the Eyes.—Hoppe[15] shows by statistics that there is little difference in the liability to injury between the right and left eye among all classes of artisans.

[1] Ann. d'Oculist., Oct., 1895.
[2] Ref. Ann. d'Oculist., Dec., 1895.
[3] Jour. Am. Med. Assoc., Nov. 16, 1895.
[4] Med. News, Aug. 3, 1895.
[5] Ann. d'Oculist., Dec., 1895.
[6] Ibid.
[7] Trans. 8th Inter. Med. Cong., 1895.
[8] Arch. d'Ophtal., June, 1895.
[9] Ibid., Feb., 1896.
[10] Ann. d'Oculist., Mar., 1896.
[11] Arch. d'Ophtal., June, 1895.
[12] Rec. d'Ophtal., Sept., 1895.
[13] Am. Jour. of Ophth., Feb., 1896.
[14] Ibid.
[15] Klin. Monatsb. f. Augenh., Mar., 1896.

NEW INSTRUMENTS.

The Röntgen process has been applied to ophthalmology by Harnisch, who only succeeded in determining the relative resistance of the various parts of the eye to the *x*-rays. They are arranged in the order of their resistance, the most translucent being placed first—capsule of the lens; choroid and retina; sclerotic; cornea; vitreous body; lens.

A new instrument for **discission of the capsule** after cataract-extraction is offered by Weeks.[1] Risley,[2] dissatisfied with most discission-instruments because they cannot be sharpened satisfactorily, uses a small spear-shaped knife, beaten out on the end of the shank and sharp at both edges. The midrib of the spear is very thin, tapering gradually to the point and to either edge.

Basevi[3] has determined **variations in local temperature** after the introduction of various substances into the conjunctival sac. He uses an **ocular stethoscope,** with which he finds a difference in the sound of the straight and oblique muscles during action, likewise a difference between the sound of their action in hyperopia and myopia. He considers the stethoscope a valuable aid in diagnosis. Williams[4] designed a **photometer** to test red signal-lenses and lanterns. It is useful in determining the variation in shade of red lenses used as signals in railroad semaphores, switchstands, etc. A small **electric lamp,** run by a storage battery, all to be carried in the pocket, is used by Mellor[5] for illuminating the cornea, anterior chamber, and lens.

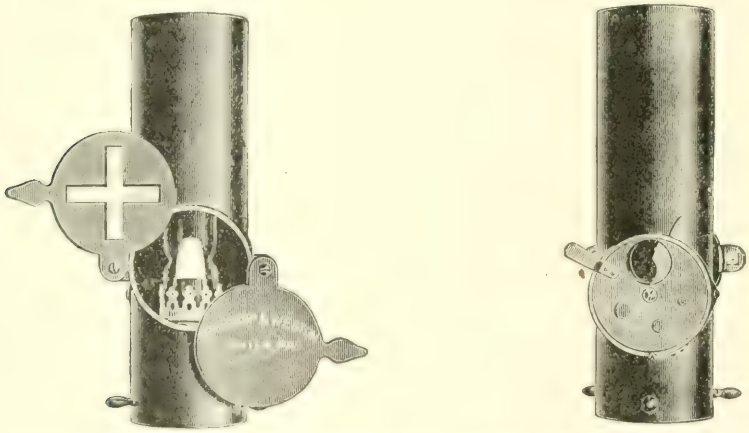


FIG. 150.—Light-screen for use in skiascopy (Ann. of Ophth. and Otol., Apr., 1896).

Zimmerman[6] employs an adjustable Light-screen especially adapted to the **shadow test.** The Welsbach burner is employed in connection with a revolving disk carrying 4 different sized apertures for skiascopy, also a Greek cross for testing muscle-balance at 20 feet (see Fig. 150). Veasey[7] has devised

[1] Trans. Am. Ophth. Soc., 1895.
[2] Ibid.
[3] Ann. d'Oculist., Sept., 1895.
[4] Trans. Am. Ophth. Soc., 1895.
[5] Univ. Med. Mag., Apr., 1896.
[6] Ann. Ophth. and Otol., Apr., 1896.
[7] Jour. Am. Med. Assoc., Mar. 28, 1896.

a **protection-rack** in which a cataract-knife or keratome may be laid for disinfection before operation.

Thoroughly convinced of the practical value of **retinoscopy** in everyday work, Perkins[1] has evolved an apparatus that promises to make the

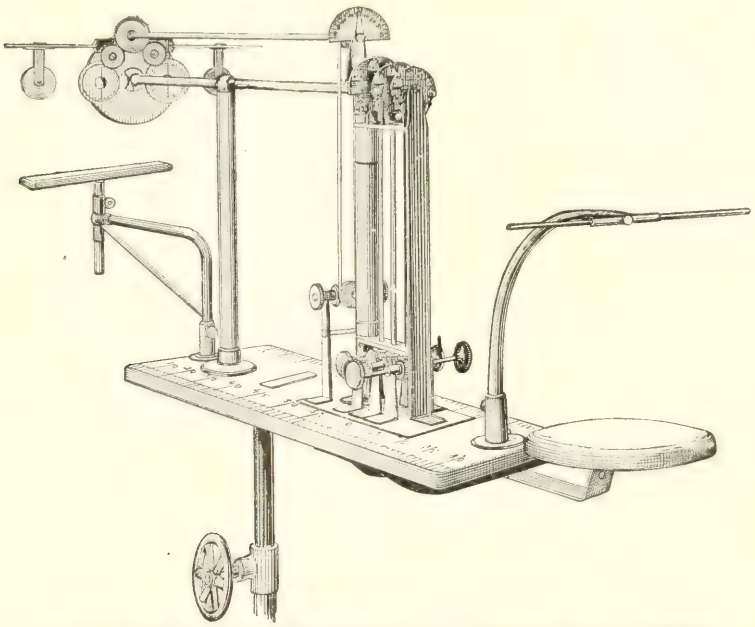


FIG. 151.—Perkins' retinoscopic apparatus (Ann. of Ophth. and Otol., July, 1896).

work of the retinoscopist an easy and convenient task. A glance at the accompanying figure will convey a better idea of the device than the fullest verbal description.

Willetts[2] has devised a **perimeter** constructed of prisms so combined as to form an hexagonal cone. With this hexagonal cone he has demonstrated [to his own satisfaction] that there is no restriction of the normal field for any color or object.

Improvements in **Javal's ophthalmometer** are suggested by Weiland,[3] who advocates the straight arm as being more exact than the arc, since it can measure the corneal diameter in amounts less than a quarter diopter, which the arc cannot do. He makes both mires movable, and brings the edges in contact instead of using steps. The chromatometer he describes may be added to the instrument at slight expense.

Lucciola[4] has made a critical **comparison of the ophthalmometer** of Reid with the instruments of Helmholtz, Javal-Schiotz, and Leroy-Dubois, from which study he concludes that with Reid's instrument one can eliminate the error, common to all the other instruments, arising from the fact that during the examination the visual line does not always coincide with the central

[1] Ann. Ophth. and Otol., July, 1896.
[2] Ibid., Jan., 1896.
[3] Arch. of Ophth., July, 1895.
[4] Ann. di Ottal., Ann. xxiv. p. 34.

point of the ophthalmometer. The author commends Reid's device (Fig. 152) in consequence of its small size (4 in. long by $1\frac{1}{4}$ broad), its portability, the precision of its measurements, the invariability of its results, and on

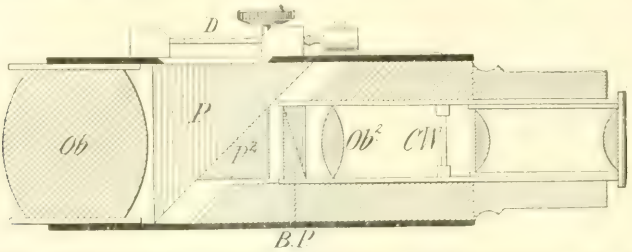


FIG. 152.—Reid's portable ophthalmometer (Ann. of Ophth. and Otol., Apr., 1896).

account of the fact that its usefulness and efficiency do not depend upon a changeable source of light (daylight). Murdoch,[1] who has had more experience with Reid's instrument than any other American worker, gives it his unqualified approval. He believes it to be more scientific and easier of application than the Javal. Its weak point, in his hands, is the difficulty expe-

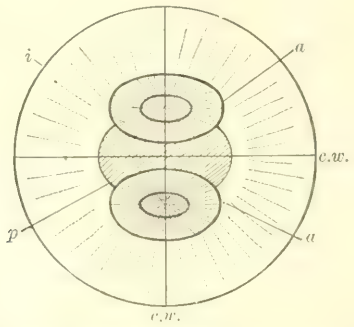


FIG. 153.—Appearance of the corneal images as viewed through Reid's portable ophthalmometer: *a*, annulus; *c.w*, cross-wire; *p*, pupil; *i*, iris (Am. Jour. of Ophth., May, 1896).

rienced in determining the exact angle of an axis against the rule (see Fig. 153).

To measure the angular deviation in muscular anomalies Shirls Jackson[2] has devised a simple, inexpensive, and practical **prismometer** that is a modification of the instrument suggested by Prentice.

[1] Ann. Ophth. and Otol., Apr., 1896. [2] Jour. Am. Med. Assoc., Jan. 4, 1896.

OTOLOGY.

By CHARLES H. BURNETT, M. D., and ARTHUR H. CLEVELAND, M. D.,

of Philadelphia.

The More Important Results of the Year's Work.—As to the external ear, the most important fact relates to the extraction of foreign bodies. It is better to let a foreign body in the ear alone than to touch it with an inexperienced hand. The injuries to the patient arising in these cases are the result of unskilful endeavors at extraction—not from the presence of the foreign substance in the ear. In the treatment of acute otitis media asepsis is more important than active antisepsis. The latter is often an irritant, and prevents the ready spontaneous recovery of the acute inflammation by the production of secondary infection of the inflamed middle ear. It is the latter condition, generally a purely artificial one, which induces the dreaded sequelæ—mastoiditis, sinus-phlebitis, and brain-abscess. In the treatment of catarrhal inflammation of the middle ear it will be seen that much remains to be done for the relief of the deafness, tinnitus, and vertigo caused by this disease. The general physician can do very little for the relief of this disorder beyond maintaining the general health of the patient and pointing out the dangers of neglecting proper local treatment. The only advance in the special treatment of this malady and its sequelæ named above has been brought about by intratympanic surgery. By this pathway the advances in the future must be made. Great improvements in the treatment of chronic purulent otitis media have been made—1. By asepsis and drainage of the ear, effected by the surgical removal of necrotic tissue from the drum-cavity, and then by a rational antisepsis impossible before; 2. By exposure of the middle-ear cavities if the first method fails to arrest purulency; 3. By exposure of otitic lesions within the cranium or in the neck and throat, either at the time of, or subsequent to, exposure of the infective middle-ear cavities. It will be seen that, on the whole, the best work in relieving both the infectious state of the middle ear and the resulting otitic lesions in the cranium and elsewhere has been done by aural surgeons. This is due to the fact that they regard both the ear and the otitic lesion elsewhere, and possess the requisite skill to lay bare the middle ear first, and then trace from it the path of infection to the brain or neck without undue sacrifice of tissues essential to hearing, while endeavoring to

expose the life-threatening otitic lesions within the cranium or in the neck. Attention is also called to the fact that many instances of carcinoma of the middle ear have their origin in chronic purulency of the ear. After careful consideration of the notes of a vast number of cases of chronic purulent otitis media and its serious consequences, we are convinced that chronic otitic purulency is generally the result not of neglect, but of infectious treatment.

DISEASES OF THE EXTERNAL EAR.

Congenital Malformations of the Auricle.—Politzer[1] reports a case of bilateral deformities of the auricle in a child of 1, and Downie[2] reports a similar case. On one side there was a distinct supernumerary auricle, but no evidence of an auditory canal in the latter instance. Stetter[3] reports the surgical correction of congenital malformations of the auricle. [Judging from the illustrations accompanying this article, we do not think the cosmetic result warranted the operation. As there was no evidence of the existence of any auditory canal or hearing in the ear operated upon before the operation, no improvement in hearing could be expected from the surgical interference.]

Barkwell and Birkett[4] correct the deformity of prominent auricles by means of the removal of an elliptical space from the back of the ear. In this removal care should be taken to begin from below and to slope the knife gradually sideways till it reaches the widest part of the ellipse. The diameters given were $1\frac{1}{4}$ by $\frac{3}{8}$ in.

Hutchinson[5] maintains that most of the **erosions of the auricle** are due to frost-bites, though some are lupous in character. Max[6] reports a case of **fibrocystic lymphangioma of the helix** of the auricle in a man.

Peck[7] reports a case of **gangrene of the ear** and face complicating pertussis, and Bishop[8] reports a case of gangrene of the ear in a child 2 years old.

Malignant Neoplasms.—Dench[9] reports 2 cases of round-cell sarcoma, 1 of fibrosarcoma, and 1 of carcinoma of the external ear observed and successfully operated upon by him. He states that malignant neoplasms in the external ear are not as serious as in other parts of the body, as shown by the literature of the subject. Denker[10] reports a case of epithelioma of the cartilaginous and cutaneous meatus and auricle in a man of 71, cured by removal of the auricle and curetting the diseased parts of the auditory canal. The meatus was kept open by skin-grafts, and sound thus reached the membrana and middle ear, which were normal. Hennebert[11] reports a case of epithelioma of the temporal bone which seems to have had its origin in traumatism of the auditory canal and neglect of the subsequent purulency.

[1] Aust. Otol. Soc.; Ann. des Mal. de l'Oreille, Apr., 1896. [2] London Pract., Mar., 1896.
[3] Arch. f. Ohrenh., Sept., 1895. [4] Med. News, Aug. 10, 1895.
[5] Arch. of Surg., Oct., 1895. [6] Ann. des Mal. de l'Oreille, Apr., 1896.
[7] Arch. of Ped., Apr., 1896. [8] Jour. Am. Med. Assoc., Mar. 28, 1896.
[9] N. Y. Eye and Ear Inf. Rep., Jan., 1896. [10] Arch. of Otol., May, 1896.
[11] Jour. of Laryn., Rhin., and Otol., May, 1896.

DISEASES OF THE EXTERNAL AUDITORY CANAL.

Foreign Bodies in the Ear.—Blake[1] records the removal of a piece of gas-carbon from the drum-cavity of a boy of 10, where it had been forced from the external auditory canal by unskilful manipulations before he was seen by Blake. Notwithstanding detachment of the auricle, the foreign substance had to be broken in two before it could be removed from the drum-cavity, where its ends were caught by the tympanic ring. The case made a perfect recovery under antiseptic treatment. Raoult[2] reports a case similar to the foregoing in which a button had been forced from the external ear into the drum-cavity of a little girl of 10. He was obliged to detach the auricle and remove the cutaneous canal from the bone of the auditory canal, as in Stacke's operation. The foreign body was then removed from the drum-cavity, and under antiseptic treatment the child recovered in 3 weeks. Adams[3] records the case of a little girl of 3 who fell with a skewer-like piece of wood in her mouth, and forced the inner end of the stick into the soft parts to the outer side of the anterior pillar of the palate and the inner side of the ramus of the lower jaw, when it broke off. The point ($\frac{1}{2}$ in. long by $\frac{3}{16}$ in. thick) penetrated the floor of the osseous auditory canal, and was finally removed by forceps through the external auditory meatus. The ear was not injured, though the jaw remained restricted in motion a year after the accident. The danger of tetanus in such a case was alluded to by Adams and by Fryer in the discussion following, the latter quoting from a French source the report of a case of tetanus resulting from getting a pebble in the ear. [We saw some months ago a case of fatal tetanus in a boy 12 years old, in which the only possible explanation of the occurrence of the disease was from careless domestic syringing of a chronic purulent otitis media.]

Böke[4] records a case of fatal meningitis set up by unskilful efforts at removal of a foreign substance from the ear of a child $3\frac{1}{2}$ years old. McBride[5] was obliged to detach the auricle and chisel away the posterior and superior wall of the bony canal in order to remove a bean which had been forced into the drum-cavity of a child of 5. Milligan[6] reports 3 cases showing the bad results of rough endeavor to remove foreign bodies from the ear. [If the average medical man would only remember that a simple substance which a child can slip into the external ear could be syringed out by anybody, much trouble would be saved. Gentle measures always succeed, but rough ones never, while the latter always do harm and often cause death.]

Larvæ in the External Ear.—Richardson[7] reports the development of "living larvæ in normal auditory canals." The larvæ were destroyed by instillation of 90% alcohol. Braislin[8] records a similar occurrence in a man of 25. In the latter case the larvæ were probably those of the screw-worm (Lucilia macellaria). There had been no previous suppuration in the ear.

[1] Am. Otol. Soc., July, 1895.
[2] Ann. des Mal. de l'Oreille, June, 1896, p. 654.
[3] Am. Otol. Soc., July, 1895.
[4] Arch. f. Ohrenh., Dec., 1895.
[5] Med. Chron., Feb., 1896.
[6] Ibid., Mar., 1896.
[7] Arch. of Otol., July and Oct., 1895.
[8] Ibid.

The larvæ were destroyed by chloroform-fumes. Barclay[1] reports 3 cases of living maggots in the ear associated with ear-disease.

Local Infection.—Szenes[2] reports a rare case of infection of the external ear from vaccine inoculation. The poison was conveyed from the arm of an infant by the nurse to her own auditory meatus. Recovery ensued in 3 weeks, leaving a characteristic scar in the lower wall of the auditory canal. Scheppegrell[3] reports infection of the ear from picking the canal with a septic toothpick; and Bruck[4] reports a case of syphilitic condylomata surrounding both external auditory meatuses.

Exostoses.—J. Orne Green[5] reports the observation and removal of a cartilaginous exostosis from the meatus. This growth had its attachment by an osseous pedicle to the tympanic attic. After detachment of the auricle from the bony meatus the new growth was seized by toothed forceps and extracted. Under antiseptic treatment of the ear (biehlorid 1 : 5000) suppuration ceased in a month, and in the course of 3 months from time of operation the ear had become normal in all respects. Green has already reported 2 similar cases, and Jack 1. Heretofore these growths were denominated osteomata, but now, adopting the classification of Birch-Hirschfeld, Green prefers to call them cartilaginous exostoses. Max[6] reports for Urbantschitsch an osseous tumor in the auditory canal, similar, apparently, to J. Orne Green's case, and Pritchard[7] has removed successfully an hyperostosis from the auditory canal, partly with hammer and chisel, and finally with a trepan moved by the dental engine. The result was entirely successful. Mathewson[8] records the removal of an exostosis from an ear in 1893 from which he removed a similar formation in 1876. As late as 1885 there was no reappearance. The removal of the exostosis this time was accomplished with a dentist's maxillary "antrum drill," instead of "square drills." The hearing was again restored. Politzer[9] reports the postmortem examination of an exostosis of the auditory canal in a man 64 years old. This growth was supposed to have originated in a previous otorrhea.

Fibroma.—Scheibe[10] reports a fibroma at the entrance of the ear-canal removed successfully with a galvanocautery snare; also, a pedunculated osteosarcoma of the ear-canal likewise successfully removed with the snare. The same writer records 3 cases of "*hairy granulation-tumor* in the *middle ear*."

Carcinoma.—Brieger[11] reports a case of carcinoma of the external ear which began with a pustule in the region of the temple 21 years previous, the ear proper being attacked 10 years previous to his investigation of the case. Kuhn[12] also showed a specimen of a primary cancroid of the auditory canal

[1] Am. Med-Surg. Bull., Feb. 29, 1896.
[2] Germ. Otol. Soc.; Arch. f. Ohrenh., Sept., 1895.
[3] Am. Med.-Surg. Bull., June 6, 1896. [4] Berl. klin. Woch., Feb. 24, 1896.
[5] Am. Otol. Soc., 1895. [6] Aust. Otol. Soc., in Ann. des Mal. de l'Oreille, Apr., 1896.
[7] King's Coll. Hosp. Rep., 1896. [8] Am. Otol. Soc., 1895.
[9] Aust. Otol. Soc., in Ann. des Mal. de l'Oreilles etc., Aug., 1895.
[10] Arch. of Otol., July and Oct., 1895.
[11] Germ. Otol. Soc.; Arch. f. Ohrenh., Sept., 1895. [12] Ibid.

in which copious nests of cancer-cells and numerous epithelial pearls were arranged in onion-like layers. In the discussion which followed Kretschmann admits that the diagnosis of cancer, originating in the middle ear, is not to be made solely upon the microscopic revelations, but, in order to avoid errors, regard must be had for the clinical symptoms.

Epithelioma.—Kuhn[1] reports a case of epithelioma in the external ear of a man 61 years old resulting fatally in the course of a year, notwithstanding operation. Krepuska[2] records a case of carcinoma of the external auditory canal, which seemed to have originated in chronic eczema. Carcinomatous degeneration occurred partly in the excretory ducts and partly in the acini of the wax-glands, and extended to the terminus of the middle ear.

Occlusion of the Auditory Canal.—From an article on this subject by Courtade[3] it seems that the preferable way to render pervious the occluded canal is to incise the neoplastic or congenital diaphragm, rather than to excise it around its periphery, and then dilate with drainage-tube and keep clean by antiseptic washes until cicatrization of the cut surfaces takes place with free edges. [A narrow tube of lead-foil makes an excellent dilator until cicatrization with free walls takes place.] Grafting flaps of skin from the concha over the cut surfaces caused by removal of diaphragms in the auditory canal does not seem to repay for the trouble of the operation, as evidenced by Courtade's experiences in this article.[4]

Hearing in Congenital Atresia of the Auditory Canal.—Bezold[5] claims that in cases of congenital atresia of the canal the same symptoms of defective hearing are present as in acquired disturbances in the conducting apparatus, and particularly in fixation of the stapes. He concludes, therefore, that in cases of deformity the cause of defective hearing is not in the inner ear, but in the outer and middle ears.

Traumatic Perforation of the Membrana Tympani.—Politzer[6] states that in traumatic perforations of the membrana tympani the edges are covered with blood, and that air by Valsalva's method passes easily through the perforation, whereas in pathologic perforations blood is absent from the edges, and air does not pass readily through by Valsalvan inflation. Corradi[7] in an article on perforation of the membrana tympani by indirect forces, regarded specially in a medico-legal aspect, claims that perforation from condensation of the air in the external auditory canal is usually found near the center of the membrane, about the lower end of the handle of the hammer, and that perforations from blows on the head without fracture are generally near the periphery. When fracture of the bone occurs the perforation in the membrana tympani depends upon the position, nature, and extent of the fracture. Fetterolf[8] reports 2 cases of traumatic rupture of the membrana tympani.

[1] Germ. Otol. Soc.; Arch. f. Ohrenh., Sept., 1895. [2] Arch. f. Ohrenh., Dec., 1895.
[3] Ann. des Mal. de l'Oreille, Dec., 1895. [4] Loc. cit. [5] Arch. of Otol., May, 1896.
[6] Internat. Otol. Congress, in Ann. Derm. de l'Oreille, Jan., 1896.
[7] Arch. f. Ohrenh., vol. xxxix., Nov., 1895. [8] Univ. Med. Mag., Phila., May, 1896.

Fracture of the Malleus.—Fritts[1] reports a case of old fracture of the handle of the malleus with fibrous union.

Cavernous Angioma.—Moure[2] removed a cavernous angioma from the posterior superior part of the drumhead in a woman of 47.

Teeth and Ears.—Barclay[3] calls attention to earache from dental irritation in large children and adults. In all cases of earache in which the tissues of the ear appear normal oral irritation should be sought for, and, if found, removed.

Diving.—According to Koch,[4] the effects of diving upon divers in the German sea service is rarely attended with pathologic results. One case of rupture of the membrane and 1 of otitis media are reported by him.

DISEASES OF THE MIDDLE EAR.

The Middle Ear normally Aseptic.—Lannois[5] has found that the middle ear of dogs is normally aseptic; inferentially, that of man is similar. He also claims that the mucous membrane of the middle ear possesses bactericidal properties, like that of the nasal mucous membrane, as demonstrated by St. Clair Thomson[6] and Wurtz and Lermoyez.[7]

Hemorrhagic Exudation in the Drum-cavity.—Haug[8] reports the occurrence of hemorrhagic exudation in the drum-cavity, as well as of simultaneous hemorrhagic otitis externa from irritation of a pulpitis in a molar tooth. Allport[9] reports the occurrence of myringitis bullosa in a young woman of 20 during an acute coryza. Puncture of the bullæ, the membrana remaining intact, was followed by recovery. Kümmel[10] observed hematotympanum in a case of pseudoleukemia. There was exudation of blood in each attic space, in which the ossicles were imbedded.

Acute otitis media as a complication of pneumonia is described by Ball,[11] and the attention of general physicians called to the fact that the ear-symptoms are often referred to brain-disease. [The cases he reports are well described, excepting so far as concerns the local ear-symptoms: here all is a blank. Of course no relief can be given the patient suffering from ear-symptoms until the ear can be examined with the otoscope, a correct diagnosis then made, and a prompt paracentesis of the membrana performed. Spontaneous evacuation of pus through the Eustachian tube in otitis media does not occur, and cannot be relied upon, as Ball appears to think.]

Acute Otitis Media in Typhoid Fever.—Hengst[12] has ascertained by collective report that in 1228 cases of typhoid fever, 28 had been complicated with acute otitis media. [In February, 1896, we saw the occurrence of acute

[1] Phila. Polyclinic, Dec. 28, 1895.
[2] Rev. de Laryn., Nov. 23, 1895.
[3] Cour. of Med., Sept., 1895.
[4] Jubilee Vol., Berlin, 1895; see Rev. Arch. of Otol., May, 1896, p. 203.
[5] Ann. des Mal. de l'Oreille, May, 1896.
[6] Internat. Med. Congress, 1895.
[7] Ann. des Mal. de l'Oreille, etc., Aug., 1893.
[8] Arch. f. Ohrenh., Sept., 1895.
[9] Jour. Am. Med. Assoc., Jan. 18, 1896.
[10] Zeit. f. Ohrenh., June, 1896.
[11] Med. News, Sept. 21, 1895.
[12] Am. Laryn., Rhinol., and Otol. Soc., Apr., 1896; Arch. of Otol., May, 1896.

otitis media on both sides in a fatal case of typhoid fever which had been treated by cold baths and profuse syringing of the nasopharynx. Causal connection between this treatment and the otitis media was suspected.]

Otitis Media in Infants.—Walb[1] has been making observations upon infants in the Children's Clinic of Bonn with the view of establishing a prophylaxis and form of treatment of suppuration in the middle ear in these young subjects. In order to promote the escape of pus from the ear he recommends the employment of inflation of the nasopharynx. Regarding prophylaxis, in view of the danger of infection of the ear from the nose he recommends cleansing the nose as soon as possible after birth. "This may be done by inflation, one nostril being left open. If infection of the ear is already suspected, inflations should be performed with both nostrils closed." Respecting these very injudicious suggestions, Zaufal wisely remarked that "as the passage of the child from intrauterine to extrauterine life is a normal physiologic process, one may venture to suppose that nature has devised plans whereby this transition may ensue without injury to the child. If, therefore, larger quantities of mucus, etc. are then found in the nose of the child, it is fair to suppose that these will be removed by the establishment of respiration and the movements of sucking and swallowing, without the necessity of artificial help. Under ordinary circumstances, then, there would be no necessity of resorting to inflations. Furthermore, such inflations, even when practised with one open nostril and a small air-bag, are not without danger, because the capacious opening in the child's Eustachian tube favors the entrance of the aforesaid masses into the middle ear, which would produce just what it is desirable to avoid." In some cases a skilful hand may employ inflation, but never should it be done by the laity.

Acute Otitis Media after Removal of Adenoids.—Barr[2] records a case of acute otitis complicated with mastoiditis, following the surgical removal of adenoids from the nasopharynx. He thinks this untoward result was largely due to the irrigations of the nasopharynx carried out before and after the operation. Barr and Brieger both consider such irrigation inadvisable. Galetti[3] observed acute otitis media resulting from tamponade of the posterior nostrils. [In fact, these cases furnish examples of the danger to the ear attending violent measures of any kind in the nasopharynx. Much that is done there does no good to the nasopharynx, while much harm accrues from it to the middle ear.]

Influenza-otitis.—Haug[4] has observed in the last 5 years 214 cases of acute influenza-otitis. In 64 of these the attic or pars epitympanica of the drum-cavity was chiefly affected. The treatment consisted in paracentesis when spontaneous rupture of the membrana did not occur promptly. [It appears that this was not followed by syringing the ear, nor by any applications to the external and middle ears, and the results were uniformly satisfactory, so far as aural treatment was concerned.]

[1] Germ. Otol. Soc.; Arch. f. Ohrenh., Sept., 1895.

[2] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, etc., Jan., 1896.

[3] Arch. ital. di Otol., Bd. iii.; Zeit. f. Ohrenh., June, 1896. [4] Arch. f. Ohrenh., May, 1896.

Acute Otitis of Measles.—Tobeitz's[1] conclusion, "that in measles, before the appearance of the exanthem, the mucous membrane of the Eustachian tube and middle ear, like that of the respiratory and digestive tract and the conjunctiva, is independently affected, and not by transmission from the catarrhal nasopharynx," has been most thoroughly substantiated by the pathologico-anatomic researches of Bezold and Rudolph,[2] who found in 17 cases of young children, out of 18 examined after death from measles, evidences of acute purulent otitis media. He concludes that in the "great majority of cases the pus in these cases is without symptoms and without any permanent lesion being completely absorbed."

Acute Otitis followed by Mastoiditis.—Holt[3] records 2 cases of acute mastoiditis following acute otitis media, occurring from 3 to 5 weeks previously. Both resulted fatally from intracranial lesions. [We cannot regard the mastoiditis in such cases as a necessary result of the acute otitis media. The only possible explanation of its occurrence is that it is due to septic retention and secondary infection of the mastoid from irritative and infectious local treatment of the ear and nasopharynx, generally before the aurist sees the case.]

Circumscribed Periphlebitis of the Jugular from Mastoiditis.—J. Orne Green[4] reports the occurrence of circumscribed periphlebitis of the jugular due to mastoiditis in a man of 28. The patient had been attacked with acute otitis in the right ear 5 weeks before he was examined by Green, who thinks "the series of pathologic processes were as follows: Suppuration of the tympanum and mastoiditis, periphlebitis (circumscribed pachymeningitis externa) of the lateral sinus, an extension of the periphlebitis down the jugular vein, and, finally, circumscribed suppuration within the sheath of the vein at the seat of operation (by Dr. George W. Gay), some 3 in. below the ear." Before Gay operated for relief of the periphlebitis, finding a little pus within the sheath of the vein, Green had opened the mastoid antrum. The patient rapidly recovered after the operation for relief of the periphlebitis. [It was not stated in the history of the case what had been done by the patient, his friends, or his physician for the ear in the 5 weeks before he was examined by Green. Hence a most important hiatus in our knowledge of the probable etiology of the mastoiditis exists. Mastoiditis is usually an unnecessary artificial consequence of acute tympanitis.]

Purulent Leptomeningitis after Acute Otitis Media.—Joch[5] observed purulent leptomeningitis following acute otitis media, with mastoiditis after measles, in a child 3 years old. The postmortem examination revealed no caries on the inner surface of the petrous bone, but pus was found filling the porus acusticus internus, and it was suggested that pus may have found its way from the middle ear by the way of the facial canal.

Acute Otitis Media followed by Meningitis.—J. C. Oliver[6] records

[1] Ann. f. Kinderh., 1887.
[2] Münch. med. Woch., Mar. 10 and 17, 1896, and Zeit. f. Ohrenh., Apr., 1896.
[3] Am. Otol. Soc., July, 1895.
[4] Ibid.
[5] Arch. f. Ohrenh., Sept., 1895.
[6] Am. Med. Assoc., May 6, 1896.

the occurrence of fatal diffuse meningitis following acute otitis media, the infection having followed the carotid canal into the cranium. [The acute purulency in this case "persisted in spite of treatment," which was conducted over 3 months, when the cerebral symptoms set in. It is very apparent to our mind that the treatment may have been irritative, and therefore largely to blame for the secondary infection of the middle ear and brain.]

Acute Otitis Media; Secondary Infection.—Cases reported by Galetti,[1] Pollack,[2] Mandelstamm,[3] Töplitz,[4] Pritchard,[5] Corradi,[6] Holinger,[7] and Röpke[8] show that secondary infection of the drum-cavity and mastoid in cases of acute otitis media is invariably due to improper—that is, usually excessive—treatment of the primary inflammation.

Septicemia from Acute Otitis Media.—Morra[9] reports a case of general septicemia resulting from acute otitis media, and causing death in 20 days after the occurrence of the acute inflammation in the ear. [No history is given of the treatment of this case in its early stages. Probably secondary infection of the drum-cavity was set up by improper domestic treatment, as often happens before the physician is called in.]

Treatment of Acute Otitis Media and Suppurative Mastoiditis.—Hessler[10] in a paper on this subject states that in acute otitis media when the membrane is imperforate he makes a large curvilinear **incision** in the membrane extending from its anterior border, beneath the malleus, to the middle of the posterior periphery. *Syringing now is strictly forbidden in all acute cases*, and the patient told to mop the ear gently with cotton as often as is necessary to keep it clean. In no instance must the meatus be kept stopped with cotton, as such treatment favors retention of pus. *Inflation of the tympana in the acute stages is strictly forbidden, as this procedure may produce further infection from the nasopharynx.* Boric-acid insufflations are also forbidden, as they become unnecessary as a prophylactic against *infection* from the auditory canal if *syringing be avoided in acute cases.* If secondary inflammation of the mastoid occur, Hessler advises immediate chiselling opening of the process by **Schwartze's method,** suggested for acute cases. By this means all cariously-softened bone is entirely removed from the aditus and antrum by means of the chisel, great care being exercised not to injure the auditory ossicles. The opening in the bone varies from 5 to 8 mm. The wound should not be irrigated, but simply lightly tamponed with iodoform-gauze if there is no parenchymatous hemorrhage: if the latter occur, the wound may be packed more firmly with iodoform-gauze. According to the degree of moisture in the dressings should the latter be changed in $1\frac{1}{2}$ days to 3 days. At such a time any moisture may be mopped from the wound by long strips of sterilized gauze. The auditory canal should be left open. As

[1] Zeit. f. Ohrenh., June, 1896.
[2] Ibid.
[3] Ibid.
[4] Am. Med.-Surg. Bull., Feb. 15, 1896.
[5] King's Coll. Hosp. Rep., 1896.
[6] Arch. ital. di Otol.; Zeit. f. Ohrenh., June, 1896.
[7] Chicago Med. Record, Dec., 1895.
[8] Zeit. f. Ohrenh., June, 1896.
[9] Il Morgagni, 1895; Ann. des Mal. de l'Oreille, May, 1896.
[10] Germ. Otol. Soc.; Arch. f. Ohrenh., Sept., 1895.

iodoform-gauze hinders granulation, the later dressings should be simple sterilized gauze.

In the discussion which followed Panse agreed in the main with Hessler, but thinks that in no instance should patients be allowed to mop their ears with cotton nor use any form of instrument upon their ears, which they never learn to do aseptically. Panse places strips of iodoform-gauze in the auditory canal in cases of acute discharge, allowing the secretion to run into a bandage, which he changes as often as is necessary, and pursues this plan so long as the strip of gauze is moist as far out as the meatus. Barth asserted that the plan of treatment recommended by Hessler has been employed in acute otitis media in Lucæ's clinic for 12 years. [It is strange we have heard so little of so good a plan until Gradenigo and Pes and others have demonstrated that there is no other rational method of treatment in the light of our present bacteriologic knowledge of the origin and course of infection of the middle ear in acute otitis media.]

Stacke states that for 5 years he has operated under strict asepsis, and avoids in acute otitic suppurations not only syringing, but also rough mopping on the surgeon's part, and absolutely no treatment by the patient. Often one dressing of the ear will be sufficient to absorb all the secretion thrown into the auditory canal. After opening the mastoid cavity he prefers to keep the wound open in its outer portions long enough to inspect the deeper parts as long as he may deem necessary.

Leutert stated that in Schwartze's clinic syringing is not done in acute otitis media. It is best, however, to keep the auditory meatus closed in order to prevent entrance of air. Brieger is in favor of dry cleansing with sterilized cotton mops in acute otitis media. A tampon in the auditory canal cannot, in his opinion, lead to retention of pus. But retention of pus may easily ensue in the mastoid wound if healing on the outer side is allowed before healing from the bottom takes place. Hartmann has long ceased to employ inflation in acute otitis media, and has spoken against irrigation of the wound after mastoid-chiselling. A bandage should be retained for a long period only in an aseptic wound, while in septic wounds the dressings should be changed as often as possible. Long-continued tamponing delays healing.

Nolterius does not think that tamponing the auditory canal with absorbent cotton or gauze after paracentesis will lead to retention of pus; after mastoid operations he considers it important to effect healing from the bottom.

Reinhard asserts that in the Schwartze school irrigation is not practised in acute suppurations. Walb considers inflations by either Politzer's method or the catheter as not only useless, but as really dangerous, as by such means pus may be forced into parts of the middle ear previously unaffected, as he pointed out 6 years ago in a meeting of aurists in Heidelberg, and was unanimously endorsed by all present. Burnett [1] warns against the danger of too active interference in cases of acute otitis media, particularly against all forms of inflation during that stage. He thinks that acute mastoid empyema is nearly always

[1] Med. News, Aug. 17, 1895.

caused by improper treatment of acute otitis media, rather than by lack of treatment. Dench [1] outlines the safest treatment of acute otitis by the general practitioner. He calls attention to the fact that no attempt to diminish the quantity of suppurative discharge until the temperature becomes normal and all pain has disappeared should be made. The benefits of the simplest antisepsis in the treatment of acute otitis media, especially by drainage with iodoform-gauze and the avoidance of all irritants, are shown by Fougeray and Vacher.[2]

Tansley [3] has found prompt **incision into the attic** in cases of acute otitis media of great advantage, as recommended and shown by Buck and Sexton many years ago. Tansley adds the excellent advice to close at once, after the paracentesis, the external auditory canal with absorbent cotton [we prefer antiseptic cotton or gauze], and to refrain from douching and syringing. Pritchard [4] insists on the danger of syringing the ear with plain warm water. He drains with cyanid gauze, applying it daily without syringing. Dench,[5] in discussing the treatment of acute inflammation of the middle ear and mastoid, recommends, when bulging of the membrana tympani occurs, early **free incision.** When the tympanic vault is involved, he advises prompt incision through the membrana flaccida, continuing outward, through the tegumentary covering of the superior wall of the meatus, for from $\frac{1}{4}$ to $\frac{1}{2}$ in. When there are mastoid symptoms, he advises the application of cold for 48 hours, then an operation if pain is not relieved by cold. He maintains that wet cups, leeches, blisters on the mastoid, and Wilde's incision are valueless. Barclay [6] discards the use of any form of inflation in acute otitis media, as tending to increase the inflammation, and urges all general practitioners not to permit its use among their patients. Beneficial results of careful **antiseptic treatment** of acute otitis media, after either spontaneous rupture or paracentesis, by means of phenol wash (2%), are shown by MacCuen Smith.[7] Better than antiseptic washes, as above recommended, is drainage of the acutely inflamed and running ear by means of a narrow strip or light tampon of antiseptic gauze in the meatus of the external auditory canal, as shown by Escat,[8] Vacher,[9] and Locoarret.[10]

Otitic Facial Paralysis.—Facial paralysis of the so-called rheumatic variety will generally be found at least associated with acute otitis media, if not caused by it, as shown by Gellé [11] and Lannois,[12] and further illustrated by a case reported by Bundy.[13] [It is highly probable that in 2 other cases of so-called rheumatic facial paralysis reported by Bundy the ear was also implicated, though the otic symptoms may not have been marked.] Trifiletti [14] records a case of **facial** paralysis following inflammation in the ear, which seems to confirm the ideas of Lannois and Gellé that in every case of so-called facial paralysis from cold the middle ear will be found simultaneously affected,

[1] Therap. Gaz., Sept. 16, 1895.
[2] Ann. des Mal. de l'Oreille, June, 1896.
[3] Am. Otol. Soc., 1895.
[4] Brit. Med. Jour., Nov. 16, 1895.
[5] Am. Med.-Surg. Bull., Nov. 15, 1895.
[6] Med. Rev., Feb. 22, 1896.
[7] Internat. Clin., vol. ii., 1895.
[8] Rev. de Laryn., d'Otol., etc., Aug., 1895.
[9] Ibid.
[10] Ibid.
[11] Ann. des Mal. de l'Oreille, Nov., 1890.
[12] Ibid.
[13] Phila. Polyclinic, Sept. 28, 1895.
[14] Ann. des Mal. de l'Oreille, Jan., 1896.

and that the diseased drum is the real cause of the facial palsy. Voss[1] claims to have relieved facial paralysis, the result of acute otitis media in a child, and which had lasted 3 months after all ear-symptoms had subsided, by opening the mastoid and clearing out the hyperemic spongy tissue from the antrum. All other treatment had failed to give relief. It is suggested that in such cases, when all else has failed and not too much time has elapsed since the setting in of the paralysis, the mastoid opening and cleaning out the antrum, as above stated, may be tried with advantage.

Chronic Catarrhal Otitis Media.—MacNaughton-Jones,[2] after careful investigation into the causative relation between hypertrophy of the turbinates and deafness, based upon an examination of 300 cases of aural disease, in which he found only 69 hypertrophies of the turbinated bodies and 18 deviations of the septum, concludes that only in a quarter of the cases aural obstruction can be regarded as causative of deafness. It is his opinion, with which we heartily coincide, that too much and too severe treatment has been directed toward hypertrophies of the turbinated bodies as a means of curing deafness—especially to be condemned is turbinotomy in such connections.

Adenoids.—Arslan[3] in an article on adenoid vegetations in the nasopharynx concludes "that they should always be removed, even when small, and all children, before being accepted into schools, institutions for the deaf and dumb, and other places of education, should submit to a nasopharyngeal examination." In the discussion which followed Helme maintained that the introduction of the finger into the nasopharyngeal cavity after the operation, to assure one's self of the completeness of the operation, is a septic procedure. Gradenigo is opposed to irrigation of this region either before or after operation, especially in children, since, on account of the width of the Eustachian orifice in them, the injections easily enter the middle ear and set up an otitis media: "blood is certainly the best of antiseptics," and should be allowed to flow. In these views Gradenigo was upheld by Brieger. Morse, however, did not share the fears of Helme regarding infection of the lacerated tissues in the nasopharynx by the index finger of the operator. [We side with Helme entirely, believing the introduction of the index finger into the nasopharynx is always a rough, and usually a septic, procedure.]

Thyroid Gland.—Spear[4] claims, as a result of his own observations, that the thyroid gland is "the center of a nervous system which controls, through connections with the sympathetic ganglia and distant nerve-centers by a peculiar inhibition, all the blood-vessels and the center of the circulatory system, the heart itself." He gives a number of cases tending to prove that frequently aural symptoms, tinnitus and deafness, accompanied by enlargement of the thyroid, are due to disease of this latter organ, and are relievable more or less entirely by hot-water applications to the thyroid gland.

[1] Arch. f. Ohrenh., vol. xxxix., Nov., 1895.

[2] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, Jan., 1895.

[3] Ibid., Dec., 1895.

[4] Boston City Hosp. Med. and Surg. Rep., 1896.

Senile Changes.—Ferreri[1] has shown that the predominant senile change in the middle ear is atrophy of the bone, particularly of the ossicula, the most important elements in the transmission of sound. Politzer claims that the deafness of old age is due to osseous changes around the oval window, and Masini believes that senile deafness is due to alterations in the articulations of the ossicles, rather than to nervous changes.

Influenza.—Bernstein[2] calls attention to the frequency of serious secondary disease of the ear as a complication of la grippe.

Remote Effect on Eye.—Urbantschitsch[3] calls attention to the possibility of disease of the ear causing disturbances in the motor apparatus of the eye.

Ménière's Symptoms or Phenomena.—[We place the consideration of ear-vertigo, Ménière's disease, etc. under that of chronic catarrhal disease of the middle ear, because we believe that it has been shown that most cases of ear-vertigo, by whatever name they are called, originate in catarrhal disease of the drum-cavity.] Fränkel-Hochwart,[4] Barr,[5] and Gruber[6] have been presenting the old subject of so-called Ménière's disease in a partially new dress. They unite in rejecting the term Ménière's disease for a general one, limiting its use to a particular form of "Ménière's symptom-group." [This, however, is not new with them, as most aurists have long occupied this ground in nomenclature of this malady. Recognizing the fact that ear-vertigo (Ménière's symptoms) may be excited by irritation in either of the divisions of the ear, the outer, middle, and inner, or even in the auditory nerve, we claimed 14 years ago that ear-vertigo should be named according to the seat of the irritation, the term Ménière's disease being reserved for ear-vertigo originating in disease of the internal ear. Tympanic vertigo is that form originating in tympanic disease, and is the most common form of aural vertigo or Ménière's symptoms. By dividing the so-called Ménière's phenomena thus according to the seat of the irritation evoking them, they can be rationally considered and treated, and in no other way.] MacNaughton-Jones[7] describes a case of apoplectiform labyrinthine vertigo, and limits to such an affection the term Ménière's disease. The term Ménière's *symptoms* may be applied to vertiginous conditions evoked by middle-ear disease. In this view he is upheld in the main by Pritchard and Barr.[8] [We advanced the same ideas regarding the different forms of ear-vertigo 14 years ago,[9] and suggested then to limit the term Ménière's disease to vertigo, etc. evoked by a lesion of the labyrinth.] Hyperæsthesia acustica may exist in connection with ear-vertigo, as in a case reported by MacNaughton-Jones.[10]

Lemairey[11] by the use of pilocarpin increased the hearing and abrogated the vertigo and tinnitus in a case of so-called Ménière's disease. Relapses occurring 1 and then 3 months later were cured by quinin.

[1] Internat. Congress; Ann. des Mal. de l'Oreille, Jan., 1896.
[2] Canad. Pract., July, 1895. [3] Univ. klin. Woch., Jan. 2, 1896.
[4] Der Ménièresche Symptomen-Complex, Wien., 1895, Alfred Hölder.
[5] Brit. Med. Jour., Dec. 28, 1896. [6] Med. Press, London, Jan. 8, 1896.
[7] Brit. Med., Jour., Nov. 23, 1895. [8] Loc. cit. [9] Phila. Med. Times, June 3, 1882.
[10] Loc. cit. [11] Ann. des Mal. de l'Oreille et du Larynx, Nov., 1895.

Ear-vertigo.—Barr[1] describes aural dizziness as due to 4 causes—viz. 1. Ménière's disease; 2. Pressure upon the walls of the middle ear; 3. Pressure upon the walls of the external meatus or outer surface of the drum-membrane; 4. Irritation of the auditory nerve. Reid[2] reports 2 cases of aural vertigo—1 caused by otitis media suppurativa, the other due to adenoid vegetation in the nasopharynx. Treatment of the ear and nose entirely stopped the vertigo in both cases. Gellé[3] draws attention to the fact that general physicians, influenced largely by Trousseau, have long been disposed to attribute vertigo of aural origin to lesion of the stomach, greatly to the detriment of otology and of the patients. In the present day vertigo connected with affections of the nervous system is often confounded with vertigo due to diseases of the labyrinth. He then speaks of vertigo due to diseases of the middle ear, to hemorrhage into the labyrinth, congestion in the labyrinth, anemia of the labyrinth, labyrinthitis, hyperesthesia of the labyrinth, toxemias, and finally of reflex labyrinthic vertigo. He thinks operations in the drum-cavity relieve cases of tympanic origin, while quinin in moderate doses is the best aid in cases of labyrinth origin. Not much aid has been derived by him from pilocarpin.

Epilepsy from Ear-disease.—Verdos[4] maintains that in epilepsy ab aure læsâ there is characteristic aura, beginning in the auditory apparatus, as shown by him in 1891. In fact, every epileptic in whom the aura begins in the ear should be examined by an aurist, who in many instances will give great aid in the treatment. In some cases of manifestly aural epilepsy the aura does not start in the ear, but in one of the extremities; later, however, it appears in one ear, to which fact the patient may draw the physician's attention, as shown by Verdos. This is a very valuable diagnostic sign.

Acoustic Railroad Signals.—Zwaardemaker[5] formulates the following conclusions regarding acoustic railway signals and the hearing power of operatives: 1. At the time of entering the service locomotive engineers and stokers should have at least, on one side, normal hearing or nearly so. 2. Every 2 to 5 years operatives should be reexamined, and their hearing-distance tested with a continuous scale, to see whether the required signals are properly heard. 3. Operatives in the service should be able to hear a whisper at least at a distance of 1 meter.

General Treatment.—Gradenigo[6] claims that the aurist has become more of a surgeon than a physician. Diseases of the external and middle ear are accessible to local treatment. Diseases of the internal ear—otitides internæ—must be reached by general remedies, if by anything. Therefore to institute a rational therapeusis in these cases not only the local aural symptoms must be regarded, but the origin of an affection must be sought, and the history of the patient, of his antecedents, and the previous history of the malady be con-

[1] Brit. Med. Jour., Dec. 28, 1895. [2] Intercol. Med. Jour. of Austral., Mar. 20, 1896.
[3] Ann. des Mal. d'Oreille et du Larynx, June, 1896.
[4] Rev. de Lar., Ot., y Riv., July, 1895, and Ann. des Mal. de l'Oreille, Mar., 1896.
[5] Zeit. f. Ohrenh., Dec., 1895.
[6] Internat. Otol. Congress, Ann. des Mal. de l'Oreille, etc., Jan., 1896.

sidered. Internal otitides are divided by Gradenigo into two categories—those which are due to acquired causes, and those due to heredity. Patients in the second group may be subdivided into—1. Nontuberculous members of tuberculous families (paratuberculous aural sclerosis); 2. Patients whose parents are syphilitic (parasyphilitic sclerosis of Fournier); 3. Patients in families other members of which are affected with similar aural diseases (otitic heredity). Generally, such patients or their parents show symptoms of rheumatism, gout, or arthritis. In the first two groups the patients have generally been affected for many years and from an early age, and the disease is in a "cicatricial" stage when they seek aid. Hence the results of treatment are not brilliant. Therefore, nasopharyngeal affections in children should get prompt and earnest attention. In the discussion which followed Morpurgo[1] maintained that in diseases of the ear the local special treatment is more important than the general, and that inflation of the drum-cavities is not as liable to inflame the middle ears as some authors claim.

Moure[2] stated that even in diabetes surgical intervention in the ears need not be feared. Of course proper general treatment must be carried out at the same time as the local treatment.

Cresswell-Baker stated that he often had employed **pilocarpin injections** in labyrinthitis, but rarely with any benefit. If after the third or fourth injection no improvement is observed, it is best to abandon this treatment. In deafness accompanying myxedema the internal administration of **thyroid gland** has given good results in his hands.

Dundas Grant urged the necessity of a careful diagnosis in order to apply properly a general treatment in ear-diseases, especially a differential diagnosis between organic and functional deafness, as in the latter **pilocarpin** is contraindicated. Corradi claimed that numerous injections of pilocarpin, if applied in the early stages of otitis interna, will give excellent results. Rutten employs in syphilis of the ear **intranasal sprays** of Van Swieten's solution. Delie and Gellé administer the **iodids** in wine mixed with tannic acid, in order to prevent intolerance. Gradenigo in closing the discussion insisted upon the fact that in many instances inflation of the tympana makes the aural disease worse. Randall[3] shows that in "labyrinthine deafness" **inflation** always makes the deafness worse. [We have long observed that inflation of the tympana, frequently applied, will make any form of aural disease worse. It is a shock *no* ear can stand very long.]

Delstanche[4] reports further successes with intratympanic **injections of liquid** (sterilized and sometimes medicated) **vaselin** in chronic otitis media (nonsuppurative), and also in some cases of acute otitis media. In the discussion which followed the views expressed were generally opposed to injections of large quantities of vaseline into the drum-cavity, a few drops being sufficient. Politzer remarked that as he had demonstrated that sclerosis of the

[1] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, etc., Jan., 1896.
[2] Ibid.
[3] Polyclinic, Phila., Feb. 8, 1896.
[4] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, Jan., 1896.

ear is caused by primary osseous lesions, it is illusory to expect essential amelioration by intratympanic injections of any kind. [In this we heartily join, and would add that the injection of anything into the drum-cavity, especially a sclerotic one, is likely to excite an acute otitis media.]

Turbinotomy, as suggested and practised by Carmalt-Jones,[1] is not to be regarded with favor as a means of curing tinnitus aurium, according to the experience of MacNaughton-Jones, Bronner, Pritchard, Warden, Baber,[2] and others.

Intratympanic Surgery in Chronic Catarrhal Otitis Media.—Dalby,[3] in referring to operative proceedings upon the tympanic membrane and the cavity of the tympanum for the relief of chronic change, said that "notwithstanding all the disappointments in this direction the fact remains that some of us (and I include myself in the number), after years of careful observation, are still in a position to make a careful selection of cases in which we are reasonably confident that if we could make a permanent and large opening in the tympanic membrane, the hearing would be restored to a most useful extent."

Richey[4] demurs at excision of the membrane and the large ossicula in sclerotic otitis media as irrational, because it does not check the progress of the disease, it deprives the middle ear of its natural protector against incursion of irritants from without, and because it removes only one altered structure in these cases. For, according to Politzer, in these cases of advanced chronic sclerotic catarrh of the middle ear secondary changes have occurred in the bony labyrinth-capsule which are beyond the reach of surgical treatment. The hyperostosis thus caused in the region of the foot-plate of the stapes renders surgical removal of the latter boneIet usually impossible and always valueless. [There are some cases, however, in which relief is given to the tinnitus, deafness, and vertigo of chronic aural catarrh by removal of the incus only, and consequent liberation of the stapes, as shown by Burnett.[5]] Moure[6] concludes that intratympanic surgical interference is of great value in chronic purulent otitis media, but should be practised with great caution for the relief of progressive sclerotic deafness.

Massage of the Middle Ear.—Scattliff[7] draws attention to the advantages of the use of the pneumatic speculum (Siegle's) as a means of applying passive motion to the membrana tympani and ossicula in chronic catarrhal deafness and tinnitus. [This is certainly a rational and safe treatment, and in many cases gives relief, as we can testify from personal experience.] Ear-massage in catarrhal deafness is recommended and carried out in various ways by many aurists. Thus, Randall[8] recommends "pneumatic massage by the finger-tip in catarrhal deafness" as a substitute for so-called "tragus-pressure." [We have for many years observed that patients teach themselves to practise

[1] Brit. Med. Jour., Nov. 23, 1895.
[2] Brit. Med. Assoc., loc. cit.
[3] Address, Sect. of Otology, Brit. Med. Assoc., in Brit. Med. Jour., Nov., 1895.
[4] Ann. of Ophth. and Otol., Apr., 1896.
[5] Internat. Clin., Jan., 1892, and Am. Jour. Med. Sci., Oct., 1896.
[6] Feret et Fils, Bordeaux, 1896.
[7] Brit. Med. Jour., Nov. 23, 1895.
[8] Phila. Polyclinic, Sept. 28, 1895.

automassage by finger-tip suction in the meatus for the relief of catarrhal deafness, with fair success.]

"Nerve-deafness."—Dundas Grant[1] has endeavored to establish the clinical existence of so-called "nerve-deafness." In the discussion which followed MacNaughton-Jones[2] regarded the term "nerve-deafness" "a highly presumptive one," and he regards it "from a clinical point of view as in a great many cases the outcome of a purely empirical differential diagnosis." In 50 cases of so-called nerve-deafness specially examined by Jones the causes and symptoms presented indicate the presence of chronic middle-ear disease, at least primarily, if not chiefly, rather than a disease of the labyrinth. If the latter existed, it was purely secondary to tympanic disorders. These last-named affections, including the nasopharynx, should receive prime attention in all cases of so-called nerve-deafness. [The latter term, however, in our opinion, should never be applied to any ear-disease in which the lesion is not primarily in the nerve-structures of the internal ear.] Milligan and Barr[3] maintain that in many cases of so-called "nerve-deafness" the disease is really in the middle ear, and both of these observers, together with Dalby, Woods, Bennett, and others, regard the use of pilocarpin as "useless and unjustifiable" in diseases of the labyrinth. Dalby stated that in many cases electricity gives temporary relief, but this is not usually maintained. ["Primary nerve-deafness" is like "hysterical deafness:" it cannot be shown to occur very often, if at all. Most cases of so-called "nerve-deafness" are found in connection with antecedent chronic catarrhal disease of the nasopharynx and middle ear. These affections of the mucous membrane of the middle ear produce tissue-changes in and about the stapes and round window. Such tissue-changes in the region of the fenestræ compromise to some extent the labyrinth-space and abrogate more or less the readiness of recoil in these safety-points to the pressure from within the labyrinth. Hence any sudden congestion of the head either in the blood- or lymph-vessels is felt all the more quickly and injuriously in the labyrinth on account of its compromised and narrowed state, and lesions of the nerve expanded in it are likely to occur. The patient perhaps now complains for the first time of tinnitus and hardness of hearing. But the lesion, though in the internal ear, is purely secondary to catarrhal disease and consequent trophic changes in the middle ear.]

Syphilitic Deafness.—Downie[4] reports a case of acquired total deafness, the result of inherited syphilis, in a lad of 17. Extensive osseous changes in the middle and internal ears were noted at the postmortem examination.

Deafness of Genital Origin.—Bonnier[5] reports the observance of what he terms intermittent deafness, or rather "variable, profound auditive inattention," affecting both ears, once in an onanist, a girl of 22, and in 2 cases in monorchidic boys (inguinal testicular ectopia). There were no organic changes in the ear in any of these subjects, and there were no other nervous phenomena.

[1] Brit. Med. Jour., Nov. 16, 1895. [2] Ibid. [3] Ibid.
[4] Arch. of Otol., Jan., 1896. [5] Ann. des Mal. de l'Oreille, June, 1896, p. 649.

Trifiletti[1] describes a case of **hysterical aphonia and deafness** in a girl of 18, and Pritchard[2] describes reflex labyrinth symptoms during pregnancy in a subject in whom the same symptoms had occurred in previous pregnancies. These symptoms vanished when pregnancy was ended. Hartmann[3] observed a case of dysbasia hysterica with hysterical otalgia.

CHRONIC PURULENT OTITIS MEDIA.

Local Medical Treatment.—Rauge[4] writes in corroboration of the modern truly antiseptic or aseptic treatment of suppuration of the middle ear, as set forth by Lermoyez and Helme and Gradenigo and Pes, already presented in the *Year-Book* for 1896, pp. 836–840. Somers[5] claims to have obtained very good results from the use of acetanilid as a dusting powder in chronic suppurative otitis media. It is employed after a thorough cleansing with hydrogen peroxid.

Dundas Grant[6] calls attention to the fact that "in cases of chronic suppuration of the ear, apart from severe attacks of pain, even when not yielding to other methods of treatment, extraordinarily favorable effects were obtained by an energetic local use of **alcohol,** a method combining bactericidal and dehydrating effects." Black[7] also advocates instillations of alcohol for the same reasons. Robertson, Macewen, and Pritchard[8] are opposed to **syringing** in chronic purulency as a means of treatment, and especially after mastoid operations. Before removal of granulations and polypi the ear should be syringed with a watery solution of carbolic acid (1 : 40), according to Pritchard. Milligan pursues a similar course before removal of granulations.

In an article on the **neglect of suppurative ear-disease** Erskine[9] condemns postponement of treatment of suppuration of the ear, tamponing the running ear with cotton, the idea of its being dangerous to stop discharge from the ear, the use of the various nostra advertised for the cure of ear-diseases, as there is "no panacea for ear-disease," and recommends that medical students be instructed in clinical otology, and that "the ear should always be examined in the early stage of the illnesses of infants and young children and in all infectious fevers and throat-affections." Dennert[10] recommends the administration of iron and other tonics in cases of stubborn suppuration of the ear. From "humanitarian" motives we should restrict mastoid operations to cases in which they are plainly indicated.

Pes and Gradenigo[11] have shown that the **bacillus pyocyaneus,** often found in otorrhea, is capable of producing an infection of the entire organism, as well as local inflammation in the ear.

Brain-disease.—Michael[12] thinks that "modern aural surgery is directly

[1] Arch. ital. di Otol., Bd. iii.; Zeit. f. Ohrenh., June, 1896.
[2] King's Coll. Hosp. Rep., 1896.
[3] Zeit. f. Ohrenh., June, 1896.
[4] Sem. méd., Jan. 11, 1896.
[5] Med. News, Apr. 4, 1896.
[6] Brit. Med. Jour., Nov. 16, 1895.
[7] Loc. cit.
[8] Brit. Med. Jour., Nov. 16, 1896.
[9] Glasg. Med. Jour., July, 1895.
[10] Arch. f. Ohrenh., Sept., 1895.
[11] Arch. of Otol., May, 1896.
[12] Volkmann's Collection, 133; see Arch. of Otol., May, 1896.

responsible for the uncomfortably large number of cases of disease of the sinuses and of abscesses of the brain which are "constantly being published by certain aural clinics." [There is much truth in this, but he should have said *misapplied* aural surgery is to blame for secondary infection of the inflamed middle ear and deeper and more vital parts of the cranium. Both patients and physicians must learn that so-called antiseptic treatment is often not aseptic.]

Surgical Treatment of Chronic Purulent Otitis Media.—Barr[1] reports successful treatment of intractable suppuration of the middle ear by operation through the mastoid, based upon 8 cases. [Two facts of importance are gained by careful reading of this article—viz. first, that all that could have been done through the canal in the form of intratympanic operation was not done, and, secondly, that the *removal of the necrotic ossicula and other diseased tissue from the attic and antrum*, which could have been effected through the canal without the mastoid trepanation, was the true cause of recovery, and not the mastoid operation simply. We feel sure of our position in this matter, because we have seen a mastoid operation alone, *without removal of the diseased ossicula*, fail to cure chronic otorrhea, which, however, promptly yielded to a subsequent operation through the auditory canal for the removal of diseased ossicula and granulation-tissue from the attic. Furthermore, it is now well established that most treatment, by lotions, powders, tympanic syringings through the auditory canal, is infectious, and therefore likely to promote attic and antrum disease, and in all these cases, as reported above, such treatment did no good. Had excision of diseased ossicula been performed through the canal, and infectious washings, etc. been omitted in these 8 cases, it is our belief that they could have been promptly cured without a resort to mastoid perforation.] Bing[2] presents a case of chronic otorrhea cured without extraction of any of the ossicles. No relapse had occurred in 18 months. He, however, advises removal of malleus and incus in stubborn cases of purulent otorrhea as facilitating treatment. Avoledo[3] has presented the results of his experiences in "intratympanic surgery in chronic purulent otitis media." His results are favorable. In the discussion following this paper Ficano asked whether the improvement in hearing following removal of carious ossicula may not be due to mobilization of the stapes. Politzer has observed that section of synechiæ may be followed by permanent improvement in hearing in some cases, while in others the improvement in hearing is only temporary. Marpurgo, while urging conservatism in operating in chronic otorrhea, believes that radical treatment (operative) is followed often by "excellent results." Gellé maintains that in chronic otorrhea the mastoid is chiefly affected, and to that the operation should be directed. [But this is not corroborated by facts.] Gradenigo maintains that an operation should be performed upon the diseased drum-cavity when a careful local treatment applied

[1] Brit. Med. Jour., Nov. 16, 1895.

[2] Aust. Otol. Soc., in Ann. des Mal. de l'Oreille, Apr., 1896.

[3] Internat. Cong. of Otol.; Ann. des Mal. de l'Oreille, Jan., 1896.

for several months fails to check the purulency. Moure divides chronic purulent otitides into two classes—those due to lesions in the attic, and those due to disease in the atrium. The second class, "inferior," are healed by ordinary local treatment, while the first class, "superior," due to attic disease, require removal of the ossicula, resection of the posterior superior wall of the auditory canal, etc.

Delie has found the local application of **lactic acid** in tuberculous otorrheas of great advantage.

Urbantschitsch[1] claims that sometimes the **extraction of the malleus** exercises a favorable effect on the hearing in the opposite ear. This is explained by the synergetic action of the tensores tympanorum in man, as in animals. Politzer,[2] however, claims that this explanation is not satisfactory.

Butler[3] records the good effects of **excision of necrotic membrana and ossicles** in chronic suppuration of the ear, as do MacCuen Smith,[4] Lake,[5] and Lichtenberg.[6] The last-named observer operated with great success in a very chronic case of attic suppuration. The hearing was rendered nearly normal.

Carcinoma of Middle Ear.—Danziger[7] reports a case of alveolar epithelioma of the middle ear in a woman of 54 who had suffered with chronic otorrhea in the carcinomatous ear since she was 10 years old. The morbid growth finally invaded the cranial cavity beneath the dura mater of the cerebellum, the jugular fossa, destroyed half of the mastoid region, the external auditory canal, the articular surface of the superior maxilla, and surrounded the carotid. Death, preceded by marked dysphagia, occurred about 6 months after the first symptoms of severe pains in the ear set in.

Sarcoma.—Storey[8] reports a case of sarcoma beginning in the middle ear, and Kuhn[9] observed 2 cases of sarcoma of the ear, not the result, however, of chronic purulency.

Tuberculosis.—Milligan,[10] after an experimental observation respecting "tuberculous disease of the mucous membrane of the middle ear and its adnexa," obtained results which in his opinion prove that "primary tuberculous disease of the middle ear is a much more frequent condition than is usually supposed to be the case." Thus in 10 cases he investigated experimentally, 8 (80%) were of a tuberculous nature, while 2 were nontuberculous. The treatment he advocates[11] is both local and general. The former may be carried out by the application of iodoform powder and packing with iodoform-gauze.

Haenel[12] reports a case of incipient rupture of both labyrinth windows in tuberculous caries of the middle ear. Hyperplasia of bone of the middle ear and foot-plate of the stapes may occur as the result of tuberculosis, as shown

[1] Aust. Otol. Soc., in Ann. des Mal. de l'Oreille, Aug., 1895.
[2] Loc. cit.
[3] Montreal Med. Jour., Oct., 1895.
[4] Internat. Clin., 1895.
[5] Med. Press, Feb. 26, 1896.
[6] Berl. klin. Woch., June 13, 1896.
[7] Monatsh. f. Ohrenh., July and Oct., 1895.
[8] Dublin J. M. Sci., Nov., 1895.
[9] Zeit. f. Ohrenh., June, 1896.
[10] Brit. Med. Jour., Nov. 16, 1895.
[11] Med. Chron., Jan., 1896.
[12] Zeit. f. Ohrenh., Dec., 1895.

by Bezold.[1] Barnick[2] describes two forms of tuberculous disease of the middle and inner ear—an acute and a chronic one. The former is of rare occurrence, while the latter is common. In the second class of cases the disease is caused by the entrance of disease-germs from the tuberculous nasopharynx, through the Eustachian tube, into the middle ear. [How ill advised, therefore, are all forms of inflation of the drum-cavities in tuberculous subjects!] The painlessness of most cases of tuberculous inflammation of the ear is explained by the "freedom from reaction possessed by the phthisical organism."

Caries.—Bryan,[3] in discussing the surgical treatment of chronic suppurative otitis media, says that chronic perforations situated in the membrana flaccida always mean caries of the ossicles. Abbe[4] reports a fatal case of carotid-artery hemorrhage occurring in a child of $2\frac{1}{2}$ years as a result of middle-ear necrosis. Chronic otorrhea had been present for 1 year. Kretschmann[5] describes a chronic purulency of the middle ear in which the caries is located chiefly in the floor of the drum-cavity in the "recessus hypotympanicus." On account of the proximity of the bulb of the jugular and of the carotid canal to this point this form of purulency in the ear becomes a dangerous one. Wolf[6] proposes to treat this form of purulency by curetting with a sharp spoon the granulations usually accompanying this form of purulency of the middle ear. Meier[7] has observed a case of suppurating thrombus of the bulb of the jugular and of the internal jugular, with granulations of the hypotympanic recess. In the same case the mastoid cavity was found filled with pus and granulations, and, communicating with it, an extradural abscess. Incision into the transverse sinus and cerebellum gave no good results, and death ensued in 2 days thereafter. Panse and Leutert[8] maintain that reinfection of the cavities operated upon in and about the ear occurs through the Eustachian tube, and therefore the former proposes to cause the remnant of the membrana to adhere to the promontory, and thus cut off the passageway from the tube to the drum-cavity. The latter advocates the method now adopted in Halle, of obliteration of the tympanic mouth of the Eustachian tube after tympanic operations in chronic otorrhea.

CHOLESTEATOMA OF THE TEMPORAL BONE.

Leutert[9] describes 2 cases of cholesteatoma—perfect retention-tumors—which were completely closed sacs lined with epithelium and covered outside with a delicate layer of connective tissue. Osteosclerosis of the temporal bone and necrosis of the facial canal near the styloid foramen may ensue in cholesteatoma of the middle-ear cavities, and artificial cholesteatoma may form through the opening retained behind the ear after a mastoid operation, as observed by Grunert.[10] [In general in mastoid cases the less destruction of the cortex the better. Retain the cavity naturally lined with mucous membrane,

[1] Arch. of Otol., Jan., 1896.
[2] Arch. f. Ohrenh., Mar. 10, 1896.
[3] Jour. Am. Med. Assoc., Oct. 26, 1895.
[4] Arch. of Otol., Jan. 1896.
[5] Arch. f. Ohrenh., Sept., 1895, vol. xxxix.
[6] Ibid. [7] Ibid. [8] Ibid.
[9] Germ. Soc.; Arch. f. Ohrenh., Sept., 1895.
[10] Arch. f. Ohrenh., May, 1896.

rather than convert it into a cavity with a cutaneous lining. The latter is out of place in a closed cavity or one intended to be such.] Redmer[1] shows that cholesteatoma and cholesteatoma-like affections of the cavities of the temporal bone may undergo spontaneous healing by discharging through the external auditory canal. He claims, therefore, that these collections in the temporal bone should be treated by Zaufal's method, without a permanent retroauricular opening, thus agreeing with Vulpius, Hansberg, and Voltenino (see the *Year-Book* for 1896, p. 865).

Treatment of Cholesteatoma.—Randall[2] regards cholesteatoma in the ear as a true neoplasm in all cases; it is "a mass of epidermal debris there collected in a cavity with inadequate exit." He advocates the "masterly conservatism of the Stacke operation, which leaves no external wound, yet by cutting away the tympanic plate and the upper posterior wall of the bony auditory canal over the antrum lays free the attic and antrum for future inspection and treatment if necessary. Of course to perform this operation the auricle and cartilaginous canal must be partly detached and drawn forward over the cheek, the attic opened by chiselling, and the auricle and cartilaginous canal then replaced.

In excision of ossicles and membrana in these cases, through the natural passage, Schwartze seems to have had 40% of cures, whereas in Stacke's[3] operation the cures amounted to 22 in 36, a greater percentage. It must be noted, however, that both of these observers seem inclined to view most cases of chronic suppuration of the ear as fundamentally or potentially cholesteatomatous in nature.] Blau,[4] Steinbrügge,[5] Gomperz,[6] and Locoarret[7] have reported cases of cholesteatoma of the ear. Sheibe[8] maintains that cholesteatoma confined to the drum-cavity is comparatively harmless, but becomes a serious matter if it extends to the aditus and antrum.

MASTOID DISEASE.

Primary Mastoiditis.—Brieger[9] reports a case of primary mastoiditis in a man, followed in 10 days with aural symptoms and abscess-formation in the neck. He states that primary mastoiditis is rare. [We have lately observed a case of primary mastoiditis followed by necrosis of the cortex only, without any aural symptoms, in a boy 5 years old. Resection of the cortex and removal of necrotic cellular substance beneath was followed by recovery, notwithstanding an attack of faucial diphtheria, with formation of false membrane in the mastoid-wound.] Lubet-Barbon[10] reports the occurrence of mastoid abscess without participation of the tympanum. Gellé and Luc[11] are of the opinion that in some cases direct infection of the bone occurs in the mastoid, as in bone-tissue elsewhere in the body.

[1] Zeit. f. Ohrenh., Apr., 1896.
[2] Phila. Polyclinic, Nov. 30, 1895.
[3] Loc. cit.
[4] Berl. klin. Woch., Jan. 13, 1896.
[5] Ibid., June 29, 1896.
[6] Ann. des Mal. de l'Oreille, etc., Apr., 1896.
[7] Rev. de Laryn., d'Otol., etc., Aug., 1895.
[8] Arch. of Otol., May, 1896.
[9] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, Jan., 1896.
[10] Ann. des Mal. de l'Oreille, June, 1896, p. 646.
[11] Ibid.

Caries of the Antrum and Mastoid.—Szenes[1] in general advises a most conservative course regarding mastoid operations, having observed many cases in which the symptoms at first seemed to call for this operation, but in which recovery finally took place, in the course of many weeks, without any operation. MacBride[2] is not disposed to regard it necessary to clean out the mastoid as a means of treatment of chronic otorrhea. Shield,[3] too, has found that extensive operations on the mastoid are disappointing in bringing about a perfect cure in chronic otorrhea.

Topography of Skull and Ear.—Both Schülzke[4] and Gaarnault[5] assert that no safe guide in operating upon the temporal bone, so far as concerns the avoidance of opening the middle fossa of the skull and the lateral sinus, can be gained from the topography of the skull, thus agreeing with Randall rather than with Koerner. Moure[6] maintains that a diploic mastoid is frequently found in the adult, and that the lateral sinus lies very near the wall of the auditory canal, and therefore not easy to avoid in operations unless it be first exposed to view, when it can be avoided in further operation in the mastoid region. Condensing osteitis and effacement of the mastoid cells and antrum are the result of chronic suppuration in this region, according to Lubet-Barbon.[7] Therefore, according to him, in cases of eburnation trepanation should be performed forward and upward toward the aditus, as in Stacke's operation, rather than backward toward the sinus. Courtade,[8] like Politzer and many other aurists, maintains that the mastoid participates in most cases in the acute inflammation of the drum-cavity. [But this is no reason why special surgical efforts should be made to draw off the acute purulent collection at that point by aspiration applied through the auditory canal. The siphonic action of a column of fluid flowing from the antrum and middle ear after rupture of the drum-membrane empties the mastoid cavity, if secondary infection of the perforation of the membrana and middle ear is not set up by irritative treatment.]

Knapp[9] presents indications for **mastoid operations** in acute purulent otitis media, with illustrative cases. [These papers are full of interest and important observations. It is very plain, however, to our minds, that had the ears been properly treated in the acute stages, the mastoid complications would never have arisen.]

Mastoiditis with Spontaneous Perforation of the Medial Plate in the Digastric Groove.—Holt[10] and Dench[11] report cases of this form of spontaneous perforation of the medial plate of the mastoid process in the digastric groove. Burnett[12] observed and reported a case of spontaneous perforation of the medial plate of the mastoid, with burrowing along the digastric groove and into the posterior pharyngeal region, with pyemic symptoms, all apparently the result of a badly-treated acute otitis media 8 months previous. Infectious

[1] Arch. f. Ohrenh., p. 139, Sept., 1895. [2] Brit. Med. Jour., Nov. 16, 1895.
[3] Loc. cit. [4] Arch. f. Ohrenh., May, 1896. [5] Paris, 1896, A. Maloine.
[6] Ann. des Mal. de l'Oreille, June, 1896. [7] Ibid. [8] Ibid., Feb., 1896.
[9] Arch. of Otol., July and Oct., 1895, and Jan., 1896.
[10] Am. Laryn., Rhin., and Otol. Soc., Apr. 17 and 18, 1896. [11] Ibid.
[12] Phila. Polyclinic, Nov. 23, 1895.

treatment of the acutely inflamed ear by nitrate of silver, hydrogen dioxid, boric acid, applied with mops, etc. insufficiently sterilized, led to secondary mastoiditis. The latter was then neglected with the above results. When the patient was first seen by Burnett distention of the buccinators forced pus from the floor of the auditory canal, and inflation of the tympanum forced pus and air-bubbles from an opening in the neck behind the sternomastoid muscle. The pus-cavity in the pharynx behind the superior constrictor was evacuated by Keen through an incision beneath the jaw, the mastoid cortex being first chiselled off and the antrum exposed. The patient recovered, under scrupulously antiseptic treatment, in 2 months, and the hearing in the course of 6 months improved from 0 to 10 feet for ordinary sounds.

If in operating upon the mastoid the cells of the tip of the process are found full of pus, Dench[1] advises, besides thorough removal of cortex, a detachment of the insertion of the sternomastoid muscle, so as to facilitate complete digital examination of the medial plate of the mastoid in the digastric groove.

In a case of perforation of the medial plate of the mastoid process—sometimes called **Bezold's mastoiditis**—observed and reported by Mendel,[2] the patient was able to force pus from the drum-cavity by pressure upon the swollen and tender region beneath the tip of the mastoid.

Mastoid in Diabetes.—Urquhart[3] reports 2 cases of abscess in the mastoid region, associated with diabetes mellitus. In but 1 of these was the bone involved, and in that there was only unhealthy appearance, but no caries. Körner[4] claims that in diabetics inflammation of the ear and mastoid may occur suddenly, and that when the mastoid is thus affected the condition of the bone is revealed by percussion. When changes have taken place within the mastoid cavity a dull percussion-sound is given out from the diseased side, while the unaffected side gives out the normal hollow sound. Mastoiditis in diabetics may be treated about as successfully as in any other subjects of a dyscrasia, as shown by cases of this nature reported by Buck.[5]

Antrum-disease.—Blake[6] reports 2 cases of antrum-disease—1 in a boy of 10, the other in a woman of 52. In both instances there was a history of acute otitis media a short time before. The discharge had ceased, but pains returned and persisted. In both cases the antra were opened by means of drill and chisel, and small congested areas of bone discovered and curetted, with entire and permanent relief.

Spontaneous Rupture of the Mastoid Cells.—Bacon[7] records the occurrence of spontaneous rupture of the mastoid cells in a girl 2 years old. [According to our experience, most mastoid abscesses will thus relieve themselves in children, and often in adults, without any interference on the surgeon's part. If the primary otitis media is not secondarily infected by too much treatment through the external ear, there will be no mastoid sequelæ.]

[1] Am. Jour. of Obstet., June, 1896. [2] Ann. des Mal. de l'Oreille, June, 1896, p. 659.
[3] Med. News, Mar. 21, 1896. [4] Zeit. f. Ohrenh., June, 1896.
[5] Am. Otol. Soc., 1895. [6] Ibid. [7] Ann. des Mal. de l'Oreille, Jan., 1896.

Involuntary Opening of the Lateral Sinus.—Chincini [1] reports 4 cases of involuntary opening of the lateral sinus during operations on the mastoid process. The hemorrhage was stopped by plugging with iodoform-gauze and sublimate dressing. Recovery ensued in from 6 to 10 weeks.

Auscultation of the Mastoid as an aid in diagnosis of deep lesions, as suggested by Okuneff,[2] seems to have no practical value.

Hysterical Mastoiditis.—Sheppard [3] describes what he terms hysterical mastoiditis, but from the 3 cases reported it would appear that the malady was only otalgia in neurotic women, made worse by their own manipulations of the external ear.

Brieger [4] claims that the presence of **tuberculous mastoiditis** cannot be proved by inoculation of matter from the mastoid, as the animals inoculated die of pyogenic processes.

Mastoid Sarcoma.—Kirchner [5] reports a case of sarcoma of the mastoid cells occurring in a man of 48, long the subject of chronic purulent otorrhea, thus adding another instance of the probable causative connection between sarcoma of the temporal bone and chronic purulent otitis media.

Ferreri [6] reports 2 cases of **epithelioma** of the temporal bone, and Gradenigo 1 case, apparently thus connected with chronic purulent otorrhea. Gradenigo and Politzer both reported the observance of carcinoma originating in the mastoid and passing to other parts of the ear.

SURGICAL EXPOSURE OF THE MIDDLE-EAR CAVITIES.

Grunert [7] contributes a valuable brochure on this subject, which he divides into three parts—viz. pathological, clinical, and experimental. His statements are based on the observation of 209 cases of chronic purulent otitis media in the clinics of Halle. The object of throwing all the middle cavities into one is, according to Grunert,[8] to "essentially favor the cure of the suppuration. Its chief advantage over simple perforation of the mastoid (Schwartze's method, universally employed in acute cases) lies in the possibility it affords to remove more completely all macroscopically diseased tissue, and subsequently to directly observe the throwing off of those diseased portions not sufficiently demarcated at the time of the operation. Even in those cases in which a permanent cure of the otorrhea is not obtained a prophylaxis is given the patient, because anatomic conditions are obtained by the operation which reduce to a minimum, even if they do not confer absolute immunity from, the risks of further pus-retention and the dangers to life connected therewith."

Removal of the Stapes.—According to Grunert,[9] removal of the stapes at the time of exenteration of the drum-cavity for the relief of chronic purulent otitis media is not necessarily followed by injury to hearing nor an

[1] Ann. des Mal. de l'Oreille, Jan., 1896. [2] Ibid. [3] N. Y. Med. Jour., May 9, 1896.
[4] Internat. Med. Cong.; Ann. des Mal. de l'Oreille, Jan., 1896.
[5] Internat. Otol. Cong.; Ann. des Mal. de l'Oreille, 1896. [6] Ibid.
[7] Arch. f. Ohrenh., vol. xl. pp. 188–253, May, 1896. [8] Ibid., p. 207.
[9] Ibid., p. 221.

intracranial lesion. [Nevertheless, removal of a stapes from a purulent ear resembles opening a door for the entrance of a flood of pus to the internal ear, and we should not like to have it done to us if our ears were affected with chronic purulency.] The desired object of the after-treatment is the complete epidermization of the common cavity formed by surgical means, of all the middle-ear cavities and the external auditory canal, and also closure of the tympanic end of the Eustachian tube (Grunert).[1] This is best obtained, according to Grunert,[2] by firm tamponade with simple sterilized gauze.

Bronner[3] reports 5 cases of disease of the attic treated by **modified Stacke's operation.** [In all of these cases of chronic purulent otorrhea there is a time when they could be cured by excision of the necrotic membrana and ossicula and the removal of synechiæ and granulations. In all cases, at any stage, this should be tried before resorting to exposure of the middle-ear cavities by any form of mastoid operation. In many cases the latter operation would then become unnecessary.]

Hartmann[4] claims that **in order to expose the attic** to view it is necessary to penetrate the superior-posterior wall of the osseous auditory canal rather than the posterior, which is too near the facial canal to permit of free incision. Castex[5] operates on the mastoid in order to expose the antrum, the aditus, and the tympanic cavity to view in obstinate cases of chronic otorrhea in young subjects, in whom the disease has defied local medication. In the main, he depends upon Stacke's method of exposure of these parts. [We must repeat what we have said elsewhere, that these major operations should not be performed, simply for the cure of chronic otorrhea, until the simpler operation of the removal of necrotic ossicula from the drum-cavity has been performed through the natural meatus.]

OTITIC CEREBRAL COMPLICATIONS.

In a discussion on otitic cerebral complications Macewen[6] stated, as his conclusions, "that neither in its presence nor in its absence is bone-conduction a reliable sign of localization as between cerebral and cerebellar abscess." "In at least two ways tubercle of the middle ear merits our attention in relation to intracranial complications—first, by the fact that tuberculous invasions of the membranes of the brain may occur from the focus in the internal or middle ear; and, secondly, tubercle of the middle ear by its slow disintegrating process lays bare the intracranial contents and exposes them to attacks of pyogenic cocci, whose potency has been increased by the pabulum which the liquefaction of the tuberculous products affords." "Besides invading the cranial contents, tubercle orginating in the middle ear and mastoid antrum and cells may enter the circulation, and when it does it occasionally induces

[1] Arch. f. Ohrenh., May, 1896, p. 233.
[2] Ibid., p. 227.
[3] Brit. Med. Jour., Nov. 23, 1896.
[4] Deutsch. Aerzte Zeit.; Ann. des Mal. de l'Oreille, Nov., 1895.
[5] Ann. des Mal. de l'Oreille, June, 1896, p. 636.
[6] Brit. Med. Jour., Nov. 16, 1895.

miliary tuberculosis of the lungs or other organ." "These invasions of other parts of the body are secondary to the primary focus in the ear, and if tubercle of the mastoid antrum and cells is to be treated, it must be on the same footing as one deals with a localized tuberculous lesion elsewhere. Except by way of improving the hearing in such cases, little good would be done by removing a small portion of granulation-tissue from the middle ear."

[This is true in a late stage, but there is usually a time in these cases when an operation through the external auditory canal for the removal of all diseased tissue in the middle ear, where the disease originates, would very probably render unnecessary the next statement of Macewen, "that the mastoid process must be freely opened, and the whole of the recesses of the temporal bone exposed, and tubercle fully eradicated." Of course if the disease is not checked while limited to the middle ear, as we maintain it can be, then the deeper cavities must be exposed when they have become invaded.]

"In contemplating the small area occupied by the middle ear and its annexes one cannot avoid being struck by the potency of the forces which may be generated within, and which, under suitable conditions, may not only involve the intracranial contents, but within a few days may destroy the function of the whole cerebrospinal system, or, entering the circulation, induce general toxemia, pulmonary infarctions, or infective gangrenous pneumonia. The middle ear, and especially the mastoid antrum and cells, while in a state of suppuration, act as an incubating chamber beautifully arranged for bacteriological work, such as the cultivation of the various pyogenic cocci. . . . . The access to some of these chambers is difficult by way of the external auditory meatus, while injections by that route will hardly reach them, and may even do harm by disseminating the elements which one wishes to remove. Some of these cells are filled with cholesteatomatous material, in which cocci are protected and preserved quite proof against the small quantities of antiseptic fluids which may reach it, as these merely play over the surface of the unctuous material without affecting the organisms within." "Besides the organisms contained in this store of solid culture-medium, others may introduce themselves, or, more probably, be introduced from without."

In regard to autoinoculation Macewen states that, "besides these sources of infection, one can reinfect the tissues of the middle ear by performing in the midst of swarms of pyogenic organisms operations involving a breach of surface in the layer of protective granulations, and thus expose fresh surfaces to the action of pyogenic cocci. Serious intracranial invasion has followed such septic operations," and he maintains "that one who treats ear-disease can no longer be looked upon as one whose whole duty is confined to the function of hearing. He has to act upon that small area of the temporal bone so as to prevent destruction of the whole organism. Every aurist therefore must be a bacteriologist, and his operations are each of them, whether he wishes it or not, bacteriological experiments."

This valuable communication concludes with the following propositions: "1. Infectious diseases extending to the brain and its membranes or to the

organs of the body from the middle ear and its annexes are preventable; 2. when once these diseases are established in the middle ear, it is necessary to adopt means which will ensure their thorough eradication, and this must be regarded as a prophylactic measure against cerebral invasion; 3. when these diseases have once penetrated into the brain, not only does one require to remove the focus in the brain and that in the ear, but likewise the path between the two by which infection has travelled."

Gradenigo[1] in his report on intracranial complications of acute and chronic purulent otitides first states that the technic of the operation demanded in these cases is fully established, but the diagnosis still presents many difficulties. However, diagnosis is much more surely established of late because of the numerous observations which have been published. He very wisely suggests that every new case should be published, regardless of whether it was operated upon or not, and whether it recovered or not, provided the nature and localization of the aural affection were established and the anatomical lesions noted with care, either during the operation or at the autopsy. In 68 cases of mastoiditis (acute and chronic) operated upon by Gradenigo during the year, 12 presented endocranial complications (17.6%). The complications numbered 14—viz. 5 extradural abscesses, 2 cerebral, 2 cerebellar, 3 thromboses of the sinus, and 2 otitic meningitides. The 8 uncomplicated extradural abscesses all recovered after operations, as did the 2 cerebral abscesses. The 2 cases of cerebellar abscess and the 2 cases of meningitis died. One case of sinus-thrombosis recovered without ligation of the jugular, 1 succumbed to a cerebellar abscess not recognized before death, and the third case died without any operation, as when first observed the patient was moribund from meningitis and purulent pulmonary foci. "The principal guide in diagnosis is the nature and locality of the aural lesion. All operations for the relief of endocranial complications of otitides should be performed by the aurist rather than by the general surgeon, because the former is better able to inquire into the disease of the drum-cavity or of the mastoid. The surgical operation for relief of an endocranial lesion is less difficult than the radical operation for the relief of chronic otorrhea." The diagnosis of meningitis is easier than that of cerebral abscess. The latter Gradenigo thinks can be positively diagnosed only when the aural lesion is on the left side and when verbal amnesia or aphasia is present. "The diagnosis of cerebellar abscesses is the most difficult. While cerebellar and cerebral abscesses may run a latent course, usually there are observed symptoms of an endocranial disease in affections limited to the temporal lobe or in simple extradural abscesses." Gradenigo has observed marked optic papillitis in 1 case of perisinuous extradural abscess, without thrombosis of the sinus, while he has never observed this symptom in other cases of cerebral abscess and thrombosis. He has also observed "intense earache, hemicrania of the same side, rigidity of the nucha, light opisthotonos, vomitings, fever, with altered vocal sounds caused by mastoid empyema and relieved entirely by operation on the mastoid. It must be borne in mind that an otitis

[1] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, Jan., 1896.

is not always the cause of nervous phenomena occurring with it in the same patient, even if they suggest an endocranial lesion, especially in a young subject."

If the symptoms of otitic complications are not grave, the surgeon may temporize in operating, but if they are urgent and life be threatened, he should operate at once. In the former conditions the mastoid should be opened first, the nature of the otitic disease discovered, and the presence or absence of complications in the adjacent parts of the temporal bone established. If the latter complications exist, the surgeon should proceed at once, if possible, to operate for their relief as soon as they are discovered by the exploratory operation on the mastoid. If they do not exist at that time, he should wait a few days to see the effect of his intervention already directed to the temporal bone."

If there is urgent need of operation and the *diagnosis is fairly established*, the surgeon may in some cases first make a temporary resection of the cranium, and treat the otitic affection by a later operation if at the first operation the endocranial abscess has been discovered. When the diagnosis cannot be clearly established, it is better, even in urgent cases, to first trephine the mastoid in order to decide as far as possible upon the way of further interference. Generally, the sinus and extradural abscess are best discovered and opened by way of the mastoid. In order to discover and open cerebral and cerebellar abscesses Gradenigo deems it inadvisable to choose the mastoid and the tympanic cavity as the way of entrance. It is then better to trephine the cranium at a point corresponding to the supposed cerebral nidus. In this way infection from the suppurating middle-ear cavities is best avoided, and a wider and more convenient field of operation obtained at once. If surgical intervention is urgent and a basis of diagnosis of the seat of a profound abscess is wanting, it is best to open at once the mastoid in order to see whether there are changes there sufficient to aid in discovering the nidus. If the result is negative, then it will be necessary to expose generously the sinus and its curve and the adjacent cerebral and cerebellar dura. In exploration, in the absence of precise diagnostic indications and also of grave symptoms, it is not deemed advisable to incise the dura mater, because cerebral hernia, which sometimes follows, is a serious complication, and one which should not be incurred unless in the presence of immediate danger or when the diagnosis is probable. In other cases intervention should be limited to exploratory puncture and aspiration with a trocar 3 mm. in diameter and to a maximum depth of 3 cm. In one instance Gradenigo thus aspirated fragments of cerebellar tissue, in this way excluding a deep abscess at this point, and *the patient was in no way injured by the intervention.*

In grave cases, even if the exploration with the aspirating needle is negative, the dura should be incised and a bistoury introduced. It is suggested also that the fluid aspirated should be examined under the microscope. The fetid odor of the serous liquid thus obtained in 1 case by Gradenigo led to the diagnosis of a cerebral abscess, subsequently relieved by operation.

In the discussion which followed Pritchard and Goris did not regard meningitis as a contraindication for operation, while Brieger maintained that it was an absolute contraindication.

Marpurgo and Pritchard think the aurist alone may operate in some cases of otitic endocranial lesions, especially in small cities. [In smaller towns the aurist may do it alone, as being better prepared than any local general surgeon, but in many cases the aurist and general surgeon can work well together.] The dental bur propelled by a foot-lathe is the instrument of the future in the opinion of Pritchard and others present at the Congress. Those burs made in Philadelphia were considered the best.[1]

Brieger took the ground that in cases in which the cerebral abscess is accompanied by meningitis lumbar puncture of the spinal arachnoid should be performed. In exploration he prefers the scalpel, though there is danger of a fatal result in its use, especially when a cerebral abscess is on the point of opening into the ventricles. He also thinks it proper to penetrate accessory cavities of the tympanum in a preliminary operation, in opposition to Gradenigo, because by this operation the surgeon may expose the fistulous path from the ear to the brain-abscess, as he has done in 2 cases.

When the diagnosis of brain-abscess is obscure he makes an osteoplastic opening in the skull at the point of election, after having made an osteoperiosteal flap from the temporal bone. After this is done an incision into the dura mater and numerous punctures into the brain may be made, and the flap replaced if the result is negative. If an abscess is found, it is an easy matter to drain the middle-ear cavities.

The prognosis in cerebral abscesses Brieger considers always doubtful, even if the abscess is found and emptied, death occurring sometimes from "toxic paralysis of the heart." Operative treatment of sinus-phlebitis he considers more successful. He cites 2 cases of thrombosis of the cavernous sinus which recovered rapidly after operative opening of the lateral sinus.

Barr[2] presents the following conclusions in his report upon intracranial otitis media: It is possible to operate successfully in endocranial abscesses, whether they be extradural, cerebral, or cerebellar; also in cases of infectious thrombosis of the lateral sinus. It is best to choose the way of entrance through the mastoid, because exposure of these cavities may furnish excellent indications for deeper procedures. For trepanning the skull the dentist's crown-drill is preferable to the trephine or the chisel and hammer. With the former a groove may be run down to the tabula vitrea. The resection may be completed with gouge and hammer. So far, operations upon extradural abscesses have given the best results. During the last 9 years 39 successful operations upon such formations have been reported. In septic thrombosis of the sinus it is deemed advisable by Barr to follow evacuation of the abscess by ligation of the jugular. In cerebral abscesses early exploration with trocar and cannula, and prudent antiseptic irrigations thereafter, are recommended. In mixed cases, in which the diagnosis is doubtful, every way by which the diseased ear

[1] Barr, ibid. [2] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, Jan., 1896.

may determine the locality of a purulent collection, whether extradural or in the cerebral substance, should be explored.

The report ends by propounding the following questions for consideration and discussion: 1. Should the cranium be opened even when there are symptoms of diffuse meningitis? 2. In cases of septic thrombosis of the sinus, besides opening the latter, is it necessary to ligate the jugular? 3. What is the best method of trephining the bone? 4. What is the value of radical operative treatment in chronic purulent otitides? 5. In the endocranial complications of otitides who should be preferred as operator, the otologist or the general surgeon?

Schmiegelow[1] reports an instructive case of endocranial complication of chronic suppuration of the middle ear in a boy of 12. An epidural abscess was found on the floor of the middle cranial fossa, evacuated, and the boy recovered. The symptoms—a slow pulse, subnormal temperature, nausea, dulness of intellect, and headache—were those of pressure from a cerebral abscess rather than of epidural abscess. Schmiegelow had never before found a *slow pulse* associated with epidural abscess alone.

Various Methods of Operation in Otitic Brain-complications.—Körner[2] has made a report on the methods of operating in various otitic brain-complications. He first draws attention to the fact that every intracranial suppuration does not always produce symptoms from which safe conclusions as to its location can be drawn. Autopsies have shown that nearly all otitic brain-abscesses are situate very near the spot of original suppuration in the ear or petrous bone, and often in demonstrable connection therewith. Since nearly always when the abscess is in the temporal lobe the tegmen tympani et antri is diseased and the abscess lies with its fundus against the dura, it is possible, as Körner claims to have shown, in proper cases to unite the emptying of the abscess with the removal of diseased bone.

Jansen also presented a report on the same subject before the same Congress,[3] basing his report upon his own observations and experiences in the Berlin Ear Clinic. During the last few years 148 cases of intracranial suppuration have been observed in this clinic, of which 108 were extradural abscesses, 35 thrombosis of the transverse sinus, and 5 brain-abscess; 96 times the suppuration lay in the posterior fossa of the skull, 38 times in the middle fossa, and 14 times in both fossæ. In the books of the clinic in Berlin 58 cases of sinus-thrombosis are recorded, and 16 otitic brain-abscesses, 9 in the cerebellum and 7 in the temporal lobe.

Perisinuous abscesses have generally been exposed by opening the cranial fossa after chiselling open the mastoid process; in a few instances they have been opened through the middle cranial fossa. In many cases—viz. in those in which the mastoid abscess and the purulent centers in the sinus form one pus-cavity—the latter has been opened without further operation. When such

[1] Zeit. f. Ohrenh., Mar., 1896.

[2] Fourth meeting German Otol. Soc.; Arch. f. Ohrenh., Sept., 1895.

[3] Loc cit.

has not been the form of the abscess, the following method has been pursued: "After the opening of the mastoid process and the antrum the posterior bony wall of the mastoid cavity has been chiselled away until the anterior lateral wall of the sinus has appeared. Exposure of the sinus must be carried forward until healthy tissue is reached, of course within limits allowed by the topographic relations." Deep-lying suppurations in the cranial cavity are reached only after removal of the posterior wall of the mastoid process in its entire extent, best accomplished, in Jansen's opinion, with long-bladed bone-forceps and very narrow chisels. If the abscess extends as far as the jugular foramen, it must be pursued by chiselling away the transverse sinus and, when necessary, by removal of a part of the floor of the posterior cranial fossa. If the part of the sinus-wall first exposed is free from disease, then the posterior cranial fossa must be so far exposed to view as to permit the removal by a raspatorium of the sinus and the dura from the posterior wall of the petrous bone. If no pus is found here, and yet the symptoms of a purulent focus in the posterior cranial fossa continue, then Jansen thinks it is necessary to expose the upper knee of the sigmoid sinus and that part of its posterior horizontal course which joins it. If pus then gushes from the middle fossa or if with continuing symptoms of intracranial suppuration the posterior fossa is found to be free from pus, the middle fossa must be opened, preferably above the linea temporalis. If the opening of the middle cranial fossa is begun by removing the lower part of the squama, inspection of the entire upper surface of the pyramid is made essentially easier. The initial puncture should be made close above the posterior part of the auditory canal, and the opening reach backward from that point several centimeters, and as far forward as necessary. Bone-forceps are best adapted for this operation.

Deep-lying extradural abscesses, which originate chiefly from irruption of pus through the semicircular canals—though sometimes from conveyance of pus along the course of the facial and major superficial petrosal nerves—usually have their center at the point where the posterior limbs of the vertical semicircular canals unite, and burrow along the posterior upper edge of the pyramid, sometimes inward and sometimes outward. Nearly all cases of this kind, as observed by Jansen, originated in acute otitis media. The upper wall of the pyramid, as far as the superior semicircular canal, the posterior upper edge of the same for the same distance, and also the adjoining posterior wall, should be removed with bone-forceps as far as the labyrinth-core. Furthermore, Jansen holds that, in order to ensure undisturbed healing and to avoid burrowing of pus along the acoustic nerve, it is best to follow the exposure of deep labyrinth-abscesses by opening the vestibule. This can be done best by removal of the posterior half or two-thirds of the upper semicircular canal, from behind and above, downward by means of narrow, straight chisels. If necessary, also the lower semicircular canal may be partly or entirely removed, and the vestibule laid open, from behind forward, by removing the posterior half of the horizontal semicircular canal.

In no instance of all the abscesses in the temporal lobe operated upon by Jansen was it possible to find the point of transition of the pus from the temporal bone to the brain, although the position of the abscess was uniformly directly over the tegmen tympani. In all of such abscesses Jansen has removed the posterior and upper wall of the mastoid portion as far as the labyrinth; then, leaving the latter intact, he has removed a part of the squama and the tegmen, and then penetrated as far inward as the mouth of the Eustachian tube and the wall of the cochlea. In this way the field of the operation is made broad and comprehends the deepest points of infection.

Von Bergmann's method of opening the middle fossa of the skull can be used with advantage for exposure of the sinus when symptoms of suppuration in the middle cranial fossa are prominent, and subsequently it becomes plain that suppuration has spread to the sinus. In general, the plan presented already for the exposure of perisinuous abscesses may be pursued for laying bare the sinus. The thrombotic part of the sinus should be opened forward and downward until undiscolored thrombosis is reached—if necessary as far as the region of the jugular foramen. Backward it is better to proceed a few centimeters farther than the thrombus extends. Excision of the outer sinus-wall ensures free drainage. When it becomes evident that the septic degeneration in the transverse sinus has not been caused by occlusion by a solid thrombus, Jansen thinks that ligation of the jugular is indicated without further investigation of the sinus. This is to be followed by ligation of the facial vein. Of 25 cases of thrombosis of the transverse sinus recently operated upon by Jansen, 11 were cured—1 after simple emptying of a perisinuous abscess, 8 after opening the thrombosed sinus, and 2 with simultaneous ligation of the jugular. In 5 cases of opening the sinus and in 4 cases with ligation of the jugular death occurred.

Brieger[1] has suggested puncturing the cerebrospinal space in order to decide whether, in addition to a brain-abscess, there is also present a complicating meningitis. The result is sometimes negative, though meningitis be present. However, even in such cases Brieger concludes the surgeon may earlier decide to operate.

Lichtheim[2] and Fürbringer[3] have employed with great success as a means of diagnosis in suspected meningitis **Quincke's method of puncture of the subarachnoid space.** The puncture is made in the median line at the level of the spinous process of one of the lumbar vertebræ. The fluid and fibrinous coagula are then examined for bacilli.

Meier[4] calls attention to the **passage of suppuration of the middle ear to the brain by way of the carotid canal,** as already recorded by Körner and others. Inflammations of the brain thus excited do not differ from other forms.

[1] Arch. f. Ohrenh., Sept., 1895.

[2] Arch. of Otol., May, 1896, p. 209.

[3] Ibid.

[4] Arch. f. Ohrenh., Bd. xxxviii., and Ann. des Mal. de l'Oreille, Jan., 1896.

OTITIC SINUS-PHLEBITIS.

Pitts,[1] Nash,[2] Lockwood,[3] Lucas,[4] Moullin,[5] Jansen,[6] Turner,[7] Barling,[8] and Böke[9] report cases of otitic sinus-phlebitis. J. Orne Green[10] reports 3 successful cases of early exploration of the lateral sinus in cases of suspected sinus-phlebitis, in which the early and certain diagnosis of phlebitis of the lateral sinus from symptoms alone is in all cases difficult, and in most cases impossible. As the mastoid inner cortex is usually the starting-point of the phlebitis, as soon as the temperature rises suddenly and high in cases of suspected sinus-phlebitis Green proceeds at once to trephine the mastoid and explore the sinus. In all of the cases reported by Green[11] the presence of a clot was excluded by the exploration, and the removal of suppurating diploe doubtless prevented extensive phlebitis and thrombosis with their usually fatal results unless relieved by operation, which, unfortunately, is likely to be performed too late. Hence the wisdom of early exploration in suspected cases. Prompt relief can thus be given to the thrombosis if it has formed and before the thrombus has become infected. If thrombosis has not yet formed, the operation checks caries of the mastoid inner cortex and prevents further phlebitis of the sinus. Passow[12] reports a case of retention of pus in the antrum, perisinuous abscess, and sinus-thrombosis, in connection with very chronic purulent otitis media. The general symptoms were severe. A radical operation for exposure of the middle-ear cavities was insufficient for relief. Exposure and free opening of the sinus, with escape of pus and necrotic tissue therefrom, was followed speedily by relief of the brain-symptoms and ultimate cessation of the chronic purulent otorrhea. [No clue as to the cause of final infection.] Otogenous pyemia may be confounded with typhoid fever, miliary tubercle, acute malignant endocarditis, and malaria, but the local symptoms and history of ear-disease will establish the differential diagnosis, according to Hessler.[13] Septic sinus-phlebitis, from acute or subacute purulent otitis media, seems to occur at times, and to get well without the detection of pus in the mastoid antrum and cells, and without any surgical interference in the sinus or jugular vein, as in a case reported by Eskridge.[14] [The path of septic infection in such cases must be directly from the middle ear to the sinus by capillary veins.] It is worthy of note that septic phlebitis in the lateral sinus often occurs in connection with acute otitis media, as in 3 cases reported by Voss.[15] Delay in operating is dangerous, but death may ensue even when an operation is performed promptly upon the sinus before grave symptoms arise, as in 1 of

[1] Lancet, Aug. 10, 1895.
[2] Ibid., No. 3753, 1895.
[3] Arch. of Pediatrics, Oct., 1895.
[4] Birmingh. Med. Rev., Jan., 1896.
[5] Lancet, Nov. 23, 1895.
[6] Volkmann's Samml. klin. Vortr., No. 130; abst. Ann. of Ophth. and Otol., St. Louis, Apr., 1896.
[7] Abst. Jour. Laryn., Rhin., and Otol., Feb., 1896.
[8] Birmingh. Med. Rev., Oct., 1895; abst. Jour. Laryn., Rhin., and Otol., Nov., 1895.
[9] Arch. f. Ohrenh., Dec., 1895.
[10] Boston M. and S. Jour., Nov. 21, 1895.
[11] Loc. cit.
[12] Berl. klin. Woch., Dec. 2, 1895.
[13] Die otogene Pyämie, 1896, pp. 416, 417.
[14] Med. News, Oct. 5, 1895.
[15] Arch. f. Ohrenh., Sept., 1895.

the 5 cases reported by Voss.[1] In these cases a profound osteomyelitis sets in. Of 5 cases operated upon by Voss, 2 proved fatal, 1 occurring in chronic and 1 in acute purulent otitis media. Influenza-otitis is sometimes followed by sinus-thrombosis, as shown in a case reported by Haug.[2] Recovery ensued in this instance after opening the sinus and freeing it from the thrombus. Severe meningeal symptoms and the optic neuritis observed in this case led to the diagnosis and the logical operation. Hessler[3] says that the treatment most satisfactory to both surgeon and patient in cases of sinus-phlebitis and pyemia of otitic origin is the "prophylactic." The first step is a thorough paracentesis of the membrana. The perforation must be maintained so as to permit free spontaneous drainage from the drum-cavity. If drainage in this way is not sufficient, a second channel must be made for its escape through the mastoid. All forms of inflation must be avoided, as well as syringings, moppings, etc. So-called "antiseptic treatments" are not as safe as they were once thought to be, or they have been shown to be "septic."[4]

If pyemia continue in spite of the antiphlogistic and prophylactic treatment as just given, and the pyemia is found to be due to osteophlebitis in the middle-ear cavities, all bone thus diseased must be removed, no matter how deep it may extend. If a subdural abscess is suspected to lie on the inner surface of the petrous bone, the outer surfaces of this bone must be chiselled away, though it appear healthy, the dura exposed, and the abscess evacuated. If sinus-thrombosis is suspected, the only sure way to find out the truth is "exploratory puncture of the sinus."[5] "Even the presence of a simple thrombus in the lateral sinus does not demand complete evacuation so long as the clot shows no signs of purulent degeneration." . . . . "Spontaneous cure of simple sinus-thrombosis in otogenous pyemia has been observed, though it is rare and cannot be in any way foretold." . . . . "If in otogenous pyemia carious defect in the bone of the transverse sulcus is found, this opening must be enlarged, the purulent thrombus removed, and double ligation and section of the jugular in the neck must be performed, in order to wash out the sinus and prevent the escape of thrombi into the general circulation." Hessler also warns against hasty operations on the sinus and jugular as follows: "If in cases of middle-ear suppuration, with chills and pyemic fluctuations in temperature, in which puncture of the lateral sinus and ligation of the jugular have demonstrated the circulation in them to be free, later on metastases occur, we must admit the possibility that the treatment introduced the further and more dangerous infection of the blood."[6] Eulenstein[7] reports a successful ligation and exsection of the internal jugular in a case of septic thrombosis of that vein.

Otitic Cerebral Abscess.—It is worthy of note that in this disease the wider pupil is observed upon the side corresponding to the unaffected half of the brain, as seen in 2 cases reported by Zeller.[8]

[1] Arch. f. Ohrenh., Sept., 1895.
[2] Ibid., May, 1896.
[3] Die otogene Pyämie, Jena, 1896, Gustav Fischer, p. 500.
[4] Op. cit., p. 449.
[5] Op. cit., p. 451.
[6] Op. cit., p. 466.
[7] Zeit. f. Ohrenh., June, 1896.
[8] Arch. f. Ohrenh., Dec., 1895.

According to Oppenheim,[1] aphasia occurring in otitic abscess of the left temporal lobe is due to a lesion of the *sensory speech-center*—an interruption in the paths connecting this part with other cortical areas. True *motor* aphasia from otitic abscess of the left temporal lobe has not yet been described, according to Oppenheim.

Hemianopsia in Otitic Cerebral Abscess.—Lannois and Jaboulay[2] observed sudden vertigo, titubation, intense headache, right hemiparesis, aphasia of conductibility without verbal deafness, and lateral homonymous hemianopsia on the right side, with conservation of pupillary reflex, in a man the subject of chronic otorrhea for 25 years. The diagnosis of the presence of an otitic abscess in the occipital lobe was confirmed by operation and postmortem examination. According to these authors, the aphasia of otitic cerebral abscesses is oftener an aphasia of conductibility than a pure motor aphasia.

Bicameral Abscess in the Temporal Lobe.—Kümmel[3] observed the occurrence of a bicameral abscess in the temporal lobe, following acute otitis media, in a child of 3, notwithstanding repeated opening of the mastoid cavity. One abscess-cavity was emptied, but death ensued 6 months after the onset of the acute otitis. [It would be highly instructive if we knew what had been done for the acute otitis before mastoid symptoms set in. We can see no reason in the history of the case, as given, for a mastoid, and finally an intracranial lesion, excepting in early secondary infection of the middle ear by improper treatment.] Treitel[4] in an article on multiple otitic abscesses of the brain states that, according to Körner, cerebral abscesses are multiple in about 16%, and, according to Schwartze, in about 17%, of such otitic lesions of the brain. Treitel gives an account of multiple otitic abscesses of the brain in a man of 22. One abscess was in the temporal, the other in the occipital lobe.

Extradural Abscess.—Kümmel[5] reports the occurrence of an extradural abscess following recurrent acute otitis media, in which the posterior cranial fossa was exposed and recovery ensued.

Optic Neuritis.—Burnett[6] calls attention to the fact that abscess of the cerebrum is generally too rapid in its course to occasion even unilateral optic neuritis, much less double optic neuritis. Pooley[7] maintains that optic neuritis is never present as long as the purulent disease is limited to the ear. It is noticed in otitic meningitis, sinus-thrombosis, and brain-abscess.

OTITIC CEREBELLAR ABSCESS.

Bacon[8] reports a case of cerebellar abscess in a man of 33, the result of chronic suppuration in the middle ear. Luc and Dundas Grant[9] have reported cases of cerebellar abscess in which the symptoms were very slight—no fever, no motor disturbances—and in which death occurred very suddenly and unex-

[1] Fortschritte der Medizin, Sept. 15, 1895.
[2] Ann. des Mal. de l'Oreille, June, 1896, p. 635.
[3] Zeit. f. Ohrenh., Apr., 1896.
[4] Ibid., May, 1895.
[5] Ibid., Apr., 1896.
[6] Univ. Med. Mag., Mar., 1896.
[7] Arch. of Otol., May, 1896.
[8] Am. Jour. Med. Sci., Aug., 1895.
[9] Brit. Med. Jour., Nov. 16, 1895.

pectedly. [It is to be regretted that we are not informed as to the condition of the eye-ground in these cases, as double optic neuritis is very often the only pathognomonic symptom of lesion in the posterior cranial fossæ.] Burnett[1] calls attention to the fact that double optic neuritis is likely to be present in cerebellar tumors and otitic cerebellar abscesses, because such lesions readily interfere with the circulation of the cavernous sinuses and ophthalmic veins. In fact, double optic neuritis is the only positive symptom of the presence of an otitic cerebellar abscess, as shown by Hansberg and Risler in 1894 and 1895 (see the *Year-Book* for 1896, p. 866). In all cases, however, the symptoms of cerebellar abscess "depend upon the level of the pressure" (Macewen). Woods[2] also reports a case of cerebellar abscess from chronic purulent otitis media in a girl of 20, in which the mastoid was opened, the middle ear cleaned out, the thrombosed lateral sinus laid bare, and the cerebellar abscess evacuated. The internal jugular was ligatured in the neck and the clot removed, but the patient died in 15 days from asthenia. Heiman[3] reports another case (his seventh) of otitic cerebellar abscess, occurring in a man affected with chronic otorrhea in the right ear. The symptoms were slow pulse, temperature 37° C. (98.6° F.), intense headache, chiefly in the right occipital region, vertigo, disturbed coordination of head, which rotated backward and forward and from right to left, continuous vomitings, constipation, difficulty of deglutition, retention of urine, speech slow and difficult, inequality of the pupils, right facial paralysis and vasomotor disturbances on the left side, augmentation of tendon-reflexes, apathy, somnolence, and general debility. Contrary to Heiman's advice, the abscess was sought in the temporosphenoidal lobe, instead of in the cerebellum. Though no pus was found, the patient grew markedly better for a short period: then he grew worse. Antisyphilitic treatment was then tried in vain, the mastoid and attic trepanned, and finally the region of the right lobe of the cerebellum was explored, but no pus was discovered there by the operation. The postmortem examination revealed an abscess in the right lobe and in the processus vermiformis of the cerebellum. The disease had existed 3 years in all; the abscess had been developing probably 2½ years, in Heiman's opinion.

The eye-grounds may remain normal even in fatal cases of otitic cerebellar abscess, as observed in a boy of 13 by Woodward.[4]

Rupture of Brain-abscess into the Posterior Cranial Fossa.—Zeller[5] records 2 cases.

Gliosarcoma of the Quadrigeminal Body.—Passow[6] observed in connection with chronic purulent otitis media what he mistook for symptoms of cerebral abscess, but which proved to be gliosarcoma of the quadrigeminal body. Schwartze[7] too mistook the symptoms of a brain-tumor for those of an otitic cerebral abscess. [The slow onset of the symptoms—headache, vomiting,

[1] Univ. Med. Mag., Mar., 1896.
[2] Brit. Med. Jour., Nov. 16, 1895.
[3] Internat. Otol. Congress; Ann. des Mal. de l'Oreille, Jan., 1896.
[4] Arch. of Otol., Jan., 1896.
[5] Arch. f. Ohrenh., Mar., 1896.
[6] Deutsch. med. Woch., Oct. 31, 1895.
[7] Arch. f. Ohrenh., Dec., 1895.

low temperature, choked disks on both sides, and a wider pupil on the side corresponding to the diseased ear—should have induced him to have diagnosed a cerebellar rather than a cerebral lesion.]

Otitic Meningitis.—Swain [1] reports a case of basilar meningitis following otitis media, in which invasion of the skull took place through the cochlea and internal auditory meatus. Dench [2] reports a case of otitic leptomeningitis in which recovery followed an operation. Beach [3] calls attention to the fact that a chronic purulency in the ear or nose may be a source of infection of the brain-cavity in fractures of the skull if they communicate in any way with the nasal cavities or temporal bone and middle ear. He claims that many cases might recover had they not been affected with chronic purulent ear-disease before the fracture of the skull occurred.

[1] Yale Med. Jour., Jan., 1896. [2] Am. Laryn., Rhin., and Otol. Soc., Apr., 1896.
[3] Jour. Am. Med. Assoc., May 6, 1896.

DISEASES OF THE NOSE AND LARYNX.

By E. FLETCHER INGALS, M. D., and HENRY G. OHLS, M. D.,
of Chicago.

The Principal Features of the Year's Work.—The presence of microorganisms and the use of antiseptics in the nares and vestibule have been during the year the subject of exhaustive researches on the part of Thomson and Hewlett. Electrolysis in hypertrophic rhinitis was the subject of an able article by Scheppegrell. Casselberry described the same method as applied to the reduction of septal spurs. Remarkable results in the treatment of ozena by inhalation of oxygen were recorded by Stoker. For nasal hemorrhage Vansant and Gillette successfully used hydrogen dioxid; to relieve headache from various causes Capp insufflated sodium chlorid into nares. The relations of intranasal disease to deafness and to melancholia were treated respectively by John A. Thompson and Bosworth, with relation of striking cases. In an extended discussion of the etiology of nasal polypi by the British Laryngological Society the necrosing-ethmoiditis theory of Woakes received its coup de grace, an observation by Williams accounting for the bare-bone sensation sometimes noted. The hope that the toxin of erysipelas would prove a specific for sarcoma is not encouraged by the unfavorable experience of Pierce and Lederman. Berens offers an extemporaneous nasal splint made of cork. Transillumination of the antrum is rendered almost as simple as inspection of the nares by the method suggested by Ohls. Diseases of the accessory sinuses have been extensively discussed in medical societies, and have given rise to a vast amount of literature. More extensive use of preparations of the thyroid and thymus glands in the treatment of goiter and Graves' disease has served to define the limitations of these remedies. For examination of the larynx Kirstein's autoscope is available in certain cases. Interesting experiments in the examination of the larynx and trachea by the Röntgen rays in connection with the cryptoscope have been reported. The use of antitoxin has reached the statistic stage, and the reports continue favorable, though Ingals points out many sources of error in the statistics submitted. Intubation for diphtheria was ably treated by Strong, and Wetherla devised an ingenious electromagnetic tube-extractor. As usual, tuberculosis of the larynx occupies an important place, and many important articles have appeared both on surgical and local medical treatment. Laryngeal neuroses and affections of the voice have received due attention. Hodgkinson has studied the physiology of the vocal cords. Muir described a novel method of medication of the bronchi.

THE NOSE.

Anatomy of the Nasal Mucous Membrane.—Wright[1] describes the vascular arrangement in sheep, which is frequently similar in man. The muscle-walled sinuses lie between the arteries and periosteum, so that the swelling of the arteries diminishes the size of veins. In chronic rhinitis the veins are thickened by growth of nonelastic fibrous tissue. In hypertrophic rhinitis the walls are dilated and paretic. Atrophy consists in substitution of fibrous for muscle-tissue and absorption of the former. Turgescence of capillaries surrounding orifices of glands closes the latter and causes the dry stage of acute coryza.

Anatomy of the Nose in the Embryo.—Killian,[2] from the examination of 239 embryos from the third to the ninth month, noted from 8 to 10 anteroposterior folds of mucous membrane on the vomer. These appear in the 3d or 4th month, and persist to the 9th, or in posterior portions to adult life in about one-third of the cases. Their function is to warm and moisten the air. The innervation is by the nasopalatine nerve. He believes persistence in adults dependent on climate and mode of life.

Anesthesia.—Newcomb recommends ethyl bromid for short operations. If long continued, it causes hypersecretion and muscular contraction. For a local anesthetic he recommends antipyrin 10, cocain 1, water 10 parts. Antipyrin, 50% solution, injected in laryngitis relieves pain for 12 hours. For the pharynx guaiacol, 5% in olive oil, applied on a swab with friction, gives longer anesthesia than cocain. Arslan used ethyl bromid 252 times without the least disagreeable symptom. Under 15 years of age 10 g. suffice; above that age the dose may be doubled. He collected 4161 cases, with few unsuccessful results and no deaths. Silk[3] said that for slight operations, like breaking up an adenoid with the finger-nail, an anesthetic may be given with the patient sitting up or semirecumbent. Nitrous-oxid gas with a whiff of ether is enough even for operations on spurs of the septum. When forceps or curet is used he gives A. C. E. mixture or a little chloroform for young children, finishing with Junker's bottle with the tube in mouth. Cocain he finds uncertain and treacherous, and is inclined to attribute favorable effects to idiosyncrasy or hypnotic suggestion. [Careful operations on the septum require from 10 to 20 minutes, or even more. It appears very difficult to secure the proper anesthesia, as recommended by Silk. Cocain has not proved treacherous or uncertain in our experience.]

Antiseptics and Intranasal Applications.—Thomson[4] draws the following conclusions: 1. The interior of the normal nasal cavity being practically aseptic, there is no need to render it more sterile than it is; 2. The presence of any foreign body in the nose tends to produce a flow of watery, and therefore weakened, mucus. The ciliated epithelium rapidly expels any solid particles coming in contact with it. Hence it is advisable to dispense

[1] Am. Jour. Med. Sci., May, 1895.
[2] Arch. f. Laryn. u. Rhin., 21, No. 2, p. 234.
[3] Practitioner, Oct., 1895.
[4] Practitioner, Dec., 1895.

with intranasal medication unless there is some indication outweighing these considerations; 3. It is more important to cleanse away any purulent accumulations in the nasal cavities by alkaline nonirritating liquids than to attempt the employment of strong antiseptic solutions; 4. It is important to disinfect any instrument or finger introduced into the nasal cavity or nasopharynx. For this purpose there is a choice of liquids, several of which will prove more easy and reliable than the adoption of an entirely aseptic method. If instruments are well scrubbed with a 5% solution of phenol immediately after use, and kept in a clean glass cupboard, it will be quite sufficient to immerse them for a short time in the same liquid before a subsequent operation.

Surgical Principles in Nasal Diseases.—Bischof[1] advises as follows: In using the douche avoid high pressure and long application; there should be no swallowing or coughing; incline the head forward; give through a narrower nostril; clear the nares with one nostril open; the nozzle of the douche should fit the nostril loosely; wear cotton-wool in the nostril after the douche; the solutions should be weak; chromic acid should always be followed by an alkaline wash; the galvanocautery should be followed by ointments and daily breaking down of the adhesions; sterilize all instruments and irrigate the nares with antiseptics after the operation. [Daily breaking down of adhesions is unnecessary except in very rare cases. Usually it is sufficient to see the patient once only, the fourth or fifth day after the cauterization.] Simpson[2] emphasizes conservatism. He notes the liability of inducing atrophy by too extensive operations.

Cocain-habit.—Bosworth[3] reported that he had never met with a case of cocain-habit that seemed much more serious than the chewing-gum habit. As a rule, the habit is associated with rum or morphin. [In this his experience is very different from that of most other laryngologists. The editors have seen not less than 40 persons much injured by the habit, and several (probably 10, who were physical and moral wrecks from the cocain-habit, formed usually from taking various so-called catarrh powders, but not infrequently from continuing the treatment ordered by some physician.] Sharp[4] related 2 cases of cocain-habit in which from 3 to 5 gr. were taken daily by the nares. In one case, a male of 27, sexual desire and ability were entirely absent. In the other, a man of 32, the first use of the drug in the morning habitually had a laxative effect.

To Heat Cautery-irons.—Scheppegrell[5] describes a method of heating large cautery-irons (Fig. 154). A 2-quart glass jar is three-quarters filled with a solution of borax, 1 part; sodium carbonate, 10 parts; water, to make the specific gravity 1030. A plate of lead 1 in. wide is coiled around the bottom of the jar, and to this is soldered the positive wire of the Edison current of 230 volts and 15 ampères. The negative wire passes across the top

[1] Quoted in Am. Med.-Surg. Bull., Feb. 8, 1896.
[2] N. Y. Med. Jour., Sept. 14, 1895.
[3] Am. Med.-Surg. Bull., Mar. 7, 1896.
[4] Boston M. and S. Jour., Jan. 2, 1896.
[5] Med. News, Aug. 10, 1896.

of the jar. Placing the neck of cautery on the negative wire and immersing the point in the fluid, the iron instantly becomes red hot, and in 3 seconds white hot. He used this method to control a hemorrhage after tonsillotomy which the Paquelin cautery failed to control. Sleicher[1] has devised a rheostat attached to the handle of a galvanocaustic snare to diminish the current while tightening the loop. He also uses guiding rings instead of a tube to avoid friction.

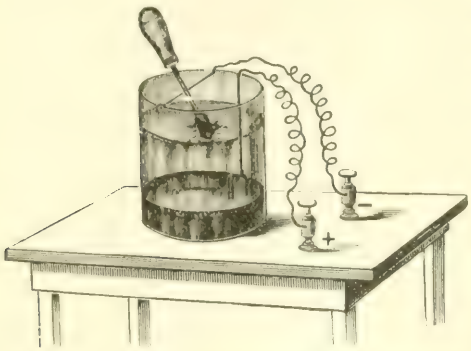


FIG. 154.—Apparatus for the heating of cautery-irons (Med. News, Aug. 10, 1895).

Damp Air and Diseases of the Air-passages.—Roe[2] distinguishes between dampness and humidity. Sudden checking of insensible perspiration causes the sensation of a cold, the common source of all catarrhal conditions of the bronchial tract. Mucous tissue subjected to a damp atmosphere becomes turgescent, hence the prevalence of catarrhal affections in the region of the Great Lakes. Sleeping near open windows accounts for many colds from exposure to damp night air. Bowditch years ago showed that consumption in New England was associated with districts and houses that were damp.

Bacteria in the Nares.—Thomson and Hewlett[3] state that the hourly inspired air amounts to about 500 liters and contains at a low average 1500 germs. The authors review the literature of the subject and describe their own experiences: 1. In all bacterioscopic investigations of the nasal fossæ, in all researches as to the action of nasal mucus, etc., a clear distinction must be made between the vestibule of the nose and the proper mucous cavity. The former is lined with skin and is furnished with hairs and sweat and sebaceous glands. It is no part of the proper nasal cavity, and only leads to it; 2. Neglect of this distinction may account for the discrepancy in previous observations on the subject; contamination from the lining of the vestibule is difficult to avoid even when this source of error has been realized; 3. In the dust and crust of mucus and debris deposited among the vibrissæ of healthy subjects microorganisms are never absent, and are rarely scanty in number; as a rule, they are abundant; 4. On the Schneiderian membrane the reverse is the case. The authors do not assert that germs are completely absent; obviously some must occasionally occur, but under normal conditions they are never plentiful; they are rarely even numerous, and in more than 80% of their observations no organisms whatever were found and the mucus was completely sterile.

Cretinism and its Effect on the Nasal Chambers.—Allen[4] describes

[1] Quoted in Jour. of Laryn., Oct., 1895.
[2] N. Y. Med. Jour., Nov. 23, 1895.
[3] Med.-Chir. Trans., 78, quoted in Am. Med.-Surg. Bull., Sept. 1, 1895.
[4] N. Y. Med. Jour., Feb. 2, 1895.

2 skulls showing cretinoid degeneration. In one the nose was prominent, the facial bones stunted, and the hard palate small. In the other the nasal bones were vertical, not projecting beyond the nasal processes of the maxillæ. The inferior turbinated bones of both were attached higher up, and were apparently of great size, probably owing to extreme shortening of the face, so that a compensatory growth occurred in these bones in the vertical direction. The floor of the nose was depressed below the level of the anterior aperture.

Hypertrophic Rhinitis; Bipolar Electrolysis.—From an experience of over 100 cases with the bipolar method of electrolyzation Scheppegrell[1] draws the following conclusions: As compared to the monopolar method, it is more rapid in its application, less painful, and more definite in action. As compared to other methods, it is more conservative, and it effects the destruction of the tissues without destroying the mucous membrane and its glandular elements. It has not the disagreeable after-pain following the application of chromic acid; being a submucous operation, the reaction following it is very slight. He has never seen a synechia formed in the nostril due to the effect of electrolyzation. As the operation is not performed as rapidly as by means of the galvanocautery, it is not so practicable in cases of young children or very nervous patients. The physical conformation of some nostrils renders it difficult to properly insert the electrolytic needles, and in these cases some other method must be adopted.

Rhinitis.—Fermi and Bretschneider[2] have made careful clinical and bacteriologic researches upon acute rhinitis. Their paper is probably the most elaborate yet written on the subject of the flora of the nasal region. They come to the following conclusions: 1. Simple coryza is not a germ-disease; 2. Many coryzas are due to the irritant action upon the nasal mucosa of exciting agents partly physical and mechanic, partly chemic—agents which attack the mucosa either from the external surface (trauma, polypus, chemical fumes, etc.) or from within (the ingestion of the iodids, the infectious diseases, etc.); 3. Colds are really due to functional, trophic, vasomotor disturbance of the mucosa of a nervous kind. They are due not to the action of mere cold as such, but to sudden and severe changes of temperature combined with a high hygrometric state, during which slight variations of temperature are more keenly felt; 4. Hay fever, so called, occurs in persons in whom trophic innervation of the nasal mucosa is permanently altered in consequence of a persistent functional alteration of the nervous system, either congenital or acquired. This may arise not merely from the ordinary physical factors, mechanic or chemic, but also in a reflex manner from excitants of general or special sensibility.

Dry Treatment.—Siebenman[3] says rhinitis is the cause of recurring epistaxis and nonsyphilitic perforation of the septum. He advises ointments,

[1] La Rev. Internat. de Laryn.; ref. Ann. of Ophth. and Otol., St. Louis, Apr., 1896.

[2] Arch. ital. di Otol., iv.,1895; ref. Am. Med.-Surg. Bull., May 2, 1896.

[3] Quoted in Am. Med.-Surg. Bull., Jan., 1896.

avoiding picking at crusts, saline baths, and tonics. For the ulcers that result he applies powdered potassium permanganate applied on a moistened cotton wound-probe.

Nasal Diphtheria, Primary.—Eeman[1] reported several cases of primary nasal diphtheria not extending to other parts. The general health was not affected. The symptoms were coryza with nasal obstruction and sometimes epistaxis. Virulent Löffler's bacilli were present. One case treated with Roux's serum was much shortened.

Etiology of Membranous Rhinitis.—Ravenel[2] reviews the literature of 77 cases, in 41 of which bacteriologic examinations were made, showing the Klebs-Löffler bacillus in 33. He notes that while the disease is usually mild in type, it is really a form of nasal diphtheria, and cases should be isolated. He reports finding the Klebs-Löffler bacillus in 10 out of 14 cases examined personally. Felsenthal[3] saw 2 cases in Berlin: 1 showed the Löffler bacillus of weakened virulence, the other none. Katz recently reported a case of typical pharyngeal diphtheria contracted from a relative with fibrinous rhinitis. Kyle[4] divides membranous inflammation into—Specific, due to specific bacteria; Nonspecific, including the fibrinoplastic variety. The symptoms are those of acute rhinitis with nasal stenosis and some constitutional depression. He describes 2 cases in children. The membrane was firmly adherent, and hemorrhage followed the removal. Culture showed staphylococcus pyogenes aureus and albus. He believes that while the disease is nondiphtheric, it is best to treat all cases of membranous inflammation of the upper air-passages as if they were true diptheria.

Etiology of Ozena.—Abel[5] says fetor is an inconstant and secondary symptom. The process may extend to the nasopharynx or begin there, and it may spread to the sinus, middle ear, larynx, and trachea. It is infectious. The cause is the bacillus mucosis ozenæ, resembling closely the pneumobacillus, but distinguishable from it. The fetid decomposition of the crusts is caused by other microorganisms. [Clinical experience does not corroborate the view of this affection being infectious.]

Bacteriology of Ozena.—Fage[6] reviews the subject and describes the coccus-like bacilli arranged in pairs surrounded by a capsule and occasionally coupled in small chains. They stain with anilin and are decolorized by Gram solution.

Treatment of Ozena.—Wright[7] criticises as inefficient the treatment by cauterization advocated by Rethi,[8] who proposed to cauterize by escharotics or the hot platinum knife, though he said the patients would get well of themselves in time. Stoker[9] described 2 cases of ozena cured by inhalations of oxygen through the nose, without other treatment. One was syphilitic ozena

[1] Jour. Laryn., May, 1896.
[2] Med. News, May 18 and 25, 1895.
[3] Münch. med. Woch., Jan. 15, 1895.
[4] N. Y. Med. Jour., July, 18, 1895.
[5] Zeit. f. Hyg. u. Infektionskrank., Bd. xxi. H. 1; rf. Canad. Pract., Jan., 1896.
[6] Rev. Int. de Rhin., 1895, v. p. 193.
[7] N. Y. Med. Jour., Feb. 8, 1896.
[8] Arch. f. Laryn. u. Rhin., Bd. ii. H. 2.
[9] Jour. Laryn., Mar., 1895.

of 5 years' duration, in which 1 month's treatment by inhaling the oxygen every alternate hour during the day caused complete disappearance of the odor. In another case of 2 years' standing associated with chlorosis, 3 days' treatment stopped the odor. In a case of suppurative middle-ear disease lasting 7 years, 9 weeks' treatment by inhalation 4 hours daily stopped the discharge, pain, and odor, and improved the hearing greatly.

Coryza.—Lermoyez[1] classified the predisposing causes: 1. Defective hygiene in diet and occupation; 2. Nasal lesions; 3. Visceral, gastrointestinal, genital, and circulatory lesions; 4. Systemic diseases and diathesis.

Schnee[2] advocates the principle established by Goltz—viz. that light shocks for a short time cause contraction of the blood-vessels; stronger and more prolonged shocks cause dilatation. Owing to the distribution of the nasociliary nerves the circulation of membranes covering the septum and turbinated bones is modified by blows delivered with the rubber hammer to the region of the inner canthus, the inner half of the brow, and the whole surface of the nose. For acute coryzas the blows should be light—for chronic conditions stronger, the shocks to be followed by friction of the nose. [This would appear to be a method in which the treatment would have to be prolonged for such a time that it would be difficult to determine whether the results were not entirely due to the efforts of nature.] Cohen[3] found that tincture of belladonna, 5 minims, added to the 10-gr. dose of potassium iodid, checked the coryza.

Winsche[4] claims that 10 gr. of chloroform holding in solution from 5 to 10 mgm. of menthol, will arrest a coryza in its early stages, and that this remedy is an excellent prophylactic against influenza. From 4 to 6 drops of the solution are poured into the hollow of one's hands; the two palms then are rubbed together, and the vapor is inhaled through the nose and mouth. Sometimes the coryza is arrested after the first inhalation, but it is recommended to repeat the inhalation once or twice during the day. [It will be remembered that it was Dr. Solis-Cohen who in 1872 first recommended the use of chloroform in acute coryza. Chloroform alone, camphor, ammonium carbonate, iodin, and other volatile substances will produce similar results.]

Coryza in Children.—Woodruff[5] states that the nasal mucus kills the germs of anthrax and of all respiratory diseases. Nasal stenosis causes hyperemia of all the respiratory mucous membrane, and in children pavor nocturnus, enuresis, deficient development of chest, dulness of special senses and mental hebetude, greater susceptibility to zymotic diseases and scrofula, even scoliotic deformity of the spine. Ziem produced the latter in kittens by suturing one nostril.

Hay Fever.—Abercrombie[6] found zinc valerianate pills, 3 gr. each, taken 3 times a day after eating, preventive and apparently curative in 1 case of hay

[1] L'Union méd., Mar. 16, 1895.

[2] Rev. de Laryn., Nov. 1, 1895.

[3] Lancet, No. 3750.

[4] Comment by Ann. of Ophth. and Otol., Apr., 1896, from Therap. Monatsh., Nov. 9, 1895.

[5] Med. Rec., N. Y., Apr. 25, 1896, quoted from monograph by Finck of Hamburg.

[6] Brit. Med. Jour., Apr. 15, 1896.

fever, the patient being distinctly neurotic. The pills were taken for a month before and during the attack, with the result of almost entirely preventing the attack. The second year the same remedy gave relief throughout the season, with the exception of 1 hour, when some of the symptoms were felt. In a paper on hay fever Strangways[1] urges the necessity of removing all diseased conditions in the nares, and claims that if we do so the frequent use of a nasal wash consisting of 2 minims of acetic acid, 1½ gr. of resorcin, and 4 gr. of salt to the ounce of water will, with the free administration of muriatic acid internally, abort and cure an attack. Smith[2] recommends the following ointment, introduced into the nares, as giving almost instant relief:

℞. Mentholis,	gr. xx;
Olei amygdal. dulcis,	ʒij;
Acidi carbolici,	♏x;
Cocain. hydrochlorat.,	gr. vj;
Unguent. zinci oxidi,	ʒss.—M.

Influenza.—Delavan[3] disapproves of operation on the nose during an epidemic of influenza, as operations usually cause a relapse with marked depression. The wound invites infection. Hay fever he considers also a contraindication for operation.

Treatment of Epistaxis.—Gillette[4] says for several years he has used a teaspoonful of hydrogen dioxid, injected into the nares, for hemorrhage, with immediate relief. During operations inject the remedy, have the patient blow the nose, and the field is again clear. Woolen in a discussion of Dr. Vansant's paper suggested insufflating dermatol as an efficient hemostatic and antiseptic. Vansant[5] reviewed the causes of epistaxis in general, and related 37 cases, of which 28 were due to slight deformity of the anterior portion of the septum with ulceration of the projecting or convex side; 3 were due to deviation of the septum with ulceration on the depressed or concave side; 2 were due to ulceration associated with atrophic rhinitis; 1 to a vicarious menstruation; 3 occurred in typhoid fever. He recommends removal of spurs and refracture of deviated septa. To stop bleeding use hydrogen dioxid pure, or alum 30 gr. to the ounce of water, or cocain 4%, followed by antipyrin from 3 to 6%. To prevent recurrence avoid picking, use warm douches and oils, with silver nitrate or balsam tolu applied to the ulcer. [We think the words "due to" in this paragraph should be replaced by "associated with." We have not seen cases in which the deflection seemed an etiologic factor.]

Trigeminal Neuralgia and Nasal Diseases.—Collier[6] reported 2 cases of severe and persistent facial neuralgia, which had resisted all treatment, cured by removal of diseased middle turbinated tissue. In 1 case the neural-

[1] Ann. Ophth. and Otol., Jan., 1896.
[2] Med. News, Oct. 19, 1895.
[3] N. Y. Med. Jour., June 8, 1895.
[4] Ibid.; N. Am. Pract., Jan., 1896.
[5] Jour. of Am. Med. Assoc., Nov. 23, 1895.
[6] Lancet, 1895, vol. ii. No. 3757.

gia had existed 4 years, and in the other the troublesome symptoms had been present off and on for 12 years.

Anosmia and Ageusia.—Schirman's[1] patient was a foundryman, aged 29, who lost the sense of smell and taste following an injury to the brain in the right temporooccipital region, without any disturbance of common sensation or motion. Irritating and caustic vapors would cause sneezing, but loss of smell was absolute. The patient could distinguish the taste of certain substances in dilute solution, but stronger solutions were tasteless. After excluding injury to the nerve-trunks the author concludes that the trauma was confined to the cortical centers.

Parosmia.—Tilley[2] describes 3 cases in which the nasal cavities and mucous membranes were normal. A man of 38 complained of a strong smell of ammonia following influenza. Another complained of the smell of tallow candles. Intranasal spray of liquor strychnia, 10 minims to the dram, cured the first, but failed in the second case. A woman 46 years of age complained of a foul smell—a case of climacteric neurosis that improved under general treatment.

Deafness from Intranasal Disease.—Thompson quotes Swinburne,[3] who found 95% of deafness due to middle-ear disease caused by primary lesion of the nose or nasopharynx. He then described 3 cases of total deafness associated with nasal obstruction, all greatly improved by removal of spurs from the septum and cauterization of hypertrophied turbinated bodies. One patient was alarmed after the operation at hearing the ticking of a clock for the first time.

Melancholia and Intranasal Disease.—Bosworth[4] reports a case of melancholia associated with right nasal occlusion from deviation of the septum and enlarged left middle turbinated bone, with myxomatous degeneration and ethmoiditis. The removal of all obstructions relieved the melancholia. The patient had previously undergone operations for varicocele, stricture, and hemorrhoids; he had submitted to castration, circumcision, ligation of the internal pudic artery, cautery to spine, seton in the neck, tenotomy of the eye-muscles, and enucleation of a healthy eye. The author attributes the melancholia to some organic change at the base of the brain, due to the ethmoid disease with pressure and circulatory disturbances.

Insufflations of Sodium Chlorid for Nasal Pain.—Capp[5] gives his experience with this remedy, first used by Mr. G. Leslie.[6] In 5 adults with faceache from decayed teeth pain was relieved at once by the insufflation of from 2 to 4 gr. of finely-ground salt. Many cases of headache from various causes yielded immediately to this remedy. A physician with headache and painful eyes, due to reading and work with the microscope, was promptly relieved. Insufflation was attended by great suffusion of eyes and nose.

[1] Med. Rec., Mar. 14, 1896.
[2] Lancet, Oct. 12, 1895.
[3] Med. Rec., Sept. 7, 1895.
[4] N. Y. Med. Jour., Oct. 12, 1895.
[5] Quoted in Quart. Med. Jour., Sheffield, Oct., 1895.
[6] Edinb. Med. Jour., Jan., 1895.

Etiology of Polypi.—In a general discussion Guye[1] said we must ascribe to the mucous membrane a peculiar predisposition which makes it produce nasal polypi as a reaction to noxious influences of different natures. Luc controverted the necrosing-ethmoiditis theory of Woakes by presenting preparations in which the underlying bone was normal, and noted the great similarity between myxomatous degeneration and simple edema of the membrane. He accounts for the usual location by the presence of folds in the membranes about the hiatus. Zuckerkandl classified polypi as inflammatory hypertrophies due to chronic irritation of the nasal membrane. He never found necrosis or carious bone, but often hypertrophy. McBride concludes that gravity is an important factor, and in some cases inflammatory changes alone may be the starting-point of the disease. Lake considers mucous polypi an outcome of hypertrophic rhinitis, with which tissue it is histologically identical. In examining a large number he had never seen a myxoma or an edematous fibroma. Williams, noting the observations of Zuckerkandl of spiculæ of bone sometimes projecting into polypi from their attachment through the periosteum, believes that they will account for the so-called rough or bare bone said to have been detected in certain cases. He believed Hopman's theory of polypoid formation from vascular obstruction. De Roaldes attributes the rarity of polypi among the negroes to more roomy nares with better drainage, and their diminished liability to acute rhinitis. Syphilitic necrosis is common in them, but is never productive of polypi. Roy[2] reported a congenital polyp in a girl persisting to the age of 14.

Fibroma of Myxomatous Variety.—Mulford[3] describes a large 3-lobed fibroma attached to the posterior end of the middle turbinated bone, removed with a snare in a curved cannula passed through the oropharynx.

Polypi and Tachycardia.—Watson[4] describes the case of a male of 35 with polypi in both nares and a pulse of 120, which became normal after removal of the polypi.

Papilloma or Papillary Fibroma of the Septum.—Wright[5] gives a description of a growth attached to the upper part of the cartilaginous septum near the columella (the point of friction in inspiration). The pedicle was small and the growth pedunculated and covered with columnar epithelium, except where friction caused the cells to approximate the squamous type. Baber[6] reported a papilloma removed from the floor of the nares and lower part of the septum. De Santi referred to a case shown by him the year before. All of these were attached near the entrance to the nose.

Polypi and Sarcoma.—Wright[7] reviews a case of mucous polypus which after many recurrences ended in a vast encephaloid sarcoma.[8] Wright thinks that the parts removed were only edematous tissue from inflammatory process set up by growth of sarcomatous elements developed in the tissue.

[1] Brit. Med. Jour., Aug. 24, 1895.
[2] Jour. of Am. Med. Assoc., Nov. 23, 1895.
[3] Am. Med.-Surg. Bull., Feb. 8, 1896.
[4] Brit. Med. Jour., Nov. 2, 1895.
[5] N. Y. Med. Jour., Dec. 14, 1895.
[6] Jour. of Laryn., Feb., 1895.
[7] N. Y. Med. Jour., Feb. 8, 1896.
[8] As reported by Bonain in Rev. de Laryn.

Bleeding Tumor of the Nasal Septum.—Sendziak [1] contributes the notes of a case in which he removed with a hot snare in two sittings a sarcomatous cavernous angioma. The patient was a man of 34, who had had obstinate epistaxis for a year. The growth was attached to the posterior superior part of the cartilaginous septum—not in Kiesselbach's place. Freudenthal [2] reported a fibroma angioma in a woman of 22 (Fig. 155). On removal



FIG. 155.—Section of fibroangioma of nasal septum (× 600): *c, c*, capillary blood-vessels lined by large endothelia in transverse section; *l*, capillary blood-vessels, with partly-detached endothelia in longitudinal section; *s*, clusters of endothelia; *f, f*, delicate fibrous connective tissue (Ann. of Ophth. and Otol., July, 1895).

with the snare alarming hemorrhage occurred. The tumor was located in Kiesselbach's place. The stump required cauterization. The author thinks the vascular tumors are due to direct injury to that region not sufficient to break the vessels at once.

Toxin and Ligation of Carotids; Nasal Sarcoma.—Lederman [3] describes an exceedingly interesting case of sarcoma of the nares for which both the toxins were injected and the common carotids were ligated. The patient was a man of 26, with round-celled sarcoma filling the right naris and projecting from both choanæ behind. The toxins were injected, beginning with 2 minims, which produced violent reaction, with chill, fever, and severe pain in the head and back, with swelling of face. Three more injections of 1 minim each were made at intervals of a few days, but the headache became unendurable and the patient refused to continue the treatment. Dawbarn then ligated both external carotids at an interval of 2 days between the operations. Two months later the tumor had diminished so much that its attachment to the middle turbinated bone was visible, and the patient had gained 20 pounds in weight. The writer intends to remove the mass with the cold snare.

[1] Jour. of Laryn., Mar., 1896. [2] Quoted in Ann. of Ophth. and Otol., July, 1895.
[3] Med. Rec., Nov. 30, 1895.

Pierce [1] records 2 undoubted and complete failures in the use of the toxins of erysipelas and the bacillus prodigiosus for sarcoma. The quantity used varied from 2 to 10 minims, and was followed by a chill, with great prostration and a temperature of from 101° to 103°. In a case treated by others with the toxins he removed the growth on recurrence, and it proved to be a fibroma polyposum fungoides teleangiectoides.

Syphilis.—Seifert quotes 27 cases of chancre of the nose, mostly on the ala nasi, least often on the septum. He notes the early induration and obstruction. In 1 case there was intense frontal headache, in another there were swelling and elevated temperature. There was indolent swelling of the submaxillary, sublingual, and preauricular glands.

Nasal Tuberculosis.—Polyak [2] describes a case of primary tuberculosis of the septum without other lesions in a well-nourished woman of 49. The right naris was full of easily-bleeding granulation-like tissue, showing giant-cells and tubercle-bacilli.

The Nose in Phthisical Patients.—Clark [3] compared the conditions found in the nares of 100 phthisical patients with those found in 100 healthy subjects, with the following results: In the healthy the turbinated bones were practically normal in 56; in 43 they were atrophied; in none was there a ridge that was markedly obstructive. Of the phthisical cases, 73 were atrophied and 16 had considerable obstruction, while 32 had slight obstruction from spurs or ridges. [This corresponds with our observations in a large number of phthisical cases. The nares are usually abnormally large, and obstructions sufficient to interfere with respiration are very infrequent.]

Foreign Bodies in the Nose.—Harrell [4] reports a case of a man of 34 with a tooth projecting into the floor of the nose. He had had severe neuralgic pain and nasal discharge for 6 years. Vaac [5] relates the case of a woman of 35 with a supernumerary tooth in the floor of the nose.

Animal Parasites in the Nose.—Bond [6] describes a woman of 49 with sharp pain in the left frontal region and profuse watery discharge for 3 weeks. She was treated 6 weeks without effect, when 4 grubs came from the nares following the application of dilute Mandl's solution, 15 minims to the ounce. Some of the grubs developed into flies, and were identified by Chas. O. Waterhouse of the Natural History Museum as Piophila casei (Linnæus), the larvæ of which feed on cheese, bacon-fat, and animal matter generally.

Etiology of Stenosis of the Nares.—Collier [7] stated that only 110 patients out of 1050 examined at the Northwestern London Hospital had vertical septa and symmetrical nares. Obstruction is rare under 10 years of age, is seldom or never congenital, and is more common after puberty. Nine-tenths of civilized persons have some abnormality of the nose. The septum is a delicate partition for the support of mucous membrane. Temporary nasal

[1] Chicago Med. Recorder, July, 1895.
[2] Quoted in Med. News, Mar. 28, 1896.
[3] Boston M. and S. Jour., Oct. 3, 1895.
[4] N. Orl. M. and S. Jour., Nov., 1895.
[5] Arch. f. Laryn., ii. No. 3, p. 301, quoted in Am. Med.-Surg. Bull., Jan. 25, 1896.
[6] Jour. Laryn., May, 1896.
[7] Quoted in Med. Press and Circ., Nov. 20, 1895.

obstruction lasting for considerable time tends to produce collapse of the walls of the closed nasal cavity, and so chronic or permanent nasal obstruction. Syphilis, rickets, and traumatism he considers quite secondary as causes.

Nasal Splints.—Berens[1] recommends splints made from cork as being quickly and easily constructed, cheap, light, elastic, and nonconductors of heat. A cork about $1\frac{1}{4}$ in. long is cut down to the shape of an almond, with flattened side for the septum. With drill or trephine it is hollowed out, leaving a shell from $\frac{1}{16}$ to $\frac{1}{8}$ in. thick. This is coated with iodoform-collodion. These splints can be cleaned in place by hydrogen dioxid or boric-acid solution, followed by oily sprays.

Electrolysis of Nasal Spurs by Current-controller.—Casselberry[2] gives a thorough exposition of the subject of electricity as applied to nasal surgery, with especial reference to electrolysis. He concludes that cartilaginous spurs can be thoroughly removed in from 1 to 3 sittings without hemorrhage, though electrolysis does not entirely supplant surgical procedures. Hard bone is not affected by it.

Ulcerations of the Nasal Septum.—Rice[3] believes that most ulcerations of the septum following operation and in atrophic rhinitis can be cured by a thorough friction with a mild antiseptic applied on moist cotton swabs.

Perforation of the Nasal Septum.—Seiler[4] says that, while perforations of the upper bony part may be pathognomonic of syphilis, this disease is but rarely the cause when the lower or cartilaginous plate alone is affected. He ascribes local traumatism as a frequent cause—*e. g.* the mucus accumulates and becomes dry, a scab soon forms, which irritates the patient, who endeavors to remove it either by the finger-nail or by forcible blowing. Slight bleeding follows expulsion of the scab. The epithelium may thus be loosened and an abrasion results. Frequent repetition of even such a trifling loss of tissue may in the aggregate exceed the natural repair, and the depression in the septum deepens and a perforation finally results. A small opening gradually increases until it may reach a considerable size. Partial necrosis of the nasal mucous membrane, so frequently observed in typhoid fever and diphtheria, is a frequent cause of perforation of the cartilaginous septum.

Rhinophyma (Rosacea Hypertrophica).—Wende[5] contributes the portrait of a patient, a German aged 63, with an immense tumor of the nose. Twenty years ago, following typhoid fever, he noticed daily temporary flushings of face for months, when the hyperemia became permanent, with the development of numerous papules, pustules, and nodules on the face. Four years later a papule developed on the right side of the nose near the margin, and grew into the tumor. The growth was elastic, and numerous pores emitted offensive sebum. The color, once purple, was almost normal. Operation was refused.

[1] In Med. Rec., Sept. 14, 1895, quoted from Boston M. and S. Jour.
[2] N. Y. Med. Jour., Aug. 31, 1895.
[3] Med. News, Feb. 8, 1896.
[4] Int. Med. Mag., June, 1896.
[5] Buffalo Med. Jour., Aug., 1895.

Cancer of the Nose.—Weed[1] reports a case of epithelioma of the right nasal ala, the growth involving the cheek to within ¼ in. of the internal canthus of the right eye, cured by the application of trichloracetic acid. The patient was also directed to keep the surface moist with a 2% solution of zinc chlorid. The author believes trichloracetic acid to be the best local caustic, and that the cure was due to that agent.

Rhinoplasty.—Keegan[2] describes the plan of arranging the flaps to prevent subsequent contraction. The soft tissue is first raised in a flap from the nasal bones, beginning above and reflecting it downward; a flap is then dissected from the forehead, twisted, and placed on the nasal bones and on the raw surface of the lower flap. The lining of the nose is thus formed of skin and will not contract.

Transillumination of the Antrum.—Ohls[3] describes a new method of transillumination of the antrum by any ordinary cautery electrode protected by a 2-dram vial (Fig. 156). It can be used in connection with any



FIG. 156.—Cautery electrode.

cautery battery. Ingals[4] found that a chemical battery ordinarily used for cauterization would not heat his own transillumination incandescent lamp, but the examination was successfully accomplished by resorting to the procedure recommended by Ohls.

Empyema of the Antrum.—Cobb[5] gives the following suggestion in diagnosis: As the frontal and ethmoidal cells have their opening at their lowest parts, while the antral opening is at its highest part, it is evident that the first two sinuses are best drained when the head is in an upright position, but the antrum when the head is inverted. The patient is therefore directed, after his nostrils have been wiped clear of pus, to put his head between his knees, and if, after a few moments on assuming the erect position, the nostril is found full of pus, it has probably come from the antrum. He also states that transillumination, though sometimes useful, does not always give certain results, for the variation in the thickness of the walls of the antrum may be considerable and the skin may be too thick to transmit light well. If these methods fail, recourse must be had to exploratory puncture by the lower meatus, canine fossa, or alveolar process, the former being preferable because the wall is thin and as there is little or no reactionary inflammation.

Wright[6] quotes M. Rudaux,[7] who reports **empyema in an infant** 3 months old, due to a prematurely-developed tooth in the floor of the antrum. Seifert also refers to similar cases.[8]

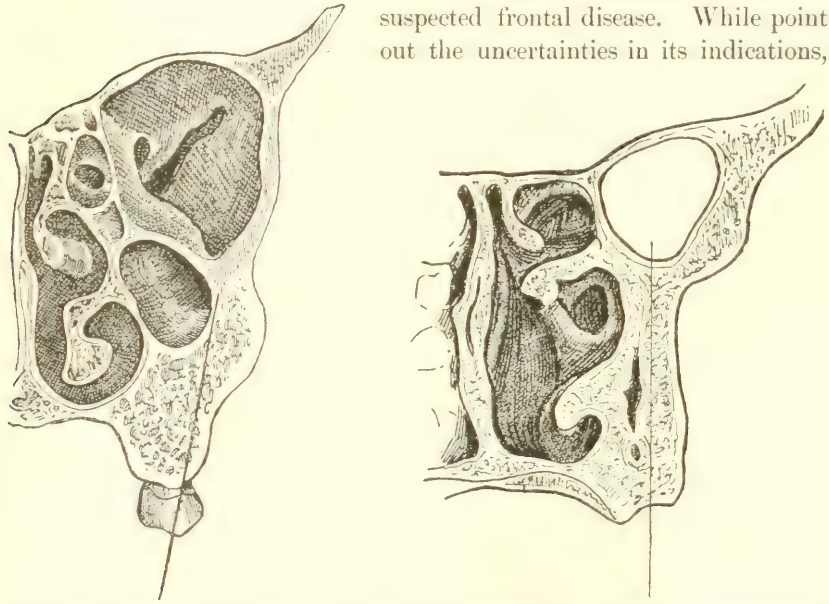
[1] Med. News, Jan. 25, 1896.
[2] Brit. Med. Jour., Oct. 12, 1895.
[3] Jour. Am. Med. Assoc., June 13, 1896.
[4] Chicago Clin. Rev., Apr., 1896.
[5] Boston M. and S. Jour., May 7, 1896.
[6] Jour. Am. Med. Assoc., Feb. 8, 1896.
[7] Ann. des Mal. de l'Oreille, Sept., 1895.
[8] Rev. de. Laryn., No. 21, 1895.

Hemorrhage following Opening of the Antrum.—Scheppegrell[1] drilled through the socket of the first molar, which caused severe hemorrhage that recurred during the month following whenever the packing was removed. It is suggested that the hemorrhage was caused by the angiomatous condition of the mucous membrane of the antrum where the trephine entered.

Necrosis of the Middle Turbinated Bone.—Thrasher[2] notes the severe neuralgia due to disease of the ethmoid bone, and thinks the facial nerve has been exsected when removal of the turbinated bone was really indicated.

Sinusitis.—Myles[3] finds the ethmoid bone nearly always softened in polypoid degeneration of the frontal sinus, though not strictly in a condition of necrosis. Lichtwitz[4] tabulated the complications found with sinus-disease, based on 149 cases: 1. Nose—pseudoozena, polypi of middle meatus, caseous coryza, cacosmia; 2. Pharynx-catarrh; 3. Ears—suppurative otitis, subacute and chronic otitis, tinnitus, vertigo; 4. Eyes—dacryocystitis, exophthalmos, partial atrophic optic neuritis; 5. Nervous system—hemicrania or frontal headache, trifacial neuralgia; 6. Cutaneous system—erysipelas, eczema, acne, seborrhea, erythema; 7. Bronchopulmonary system—pseudophymia, asthma; 8. Digestive tract—gastric dilatation, enteritis; 9. Heart—pulse slackened, phlebitis.

Diagnosis of Sinusitis.—Gleitsmann[5] recommends pressure on the anterior wall and tapping the glabella in suspected frontal disease. While pointing out the uncertainties in its indications, he says transillumination should not be omitted. Bosworth[6] describes a case of



FIGS. 157, 158.—Illustrating the difficulty of opening the antrum through the root-cavities when the antrum is small or abnormal in location (Jour. of Laryn., Oct., 1895).

[1] Jour. of Laryn., Sept., 1895.
[2] N. Y. Med. Jour., Dec. 7, 1895.
[3] Am. Med.-Surg. Bull., Mar. 7, 1896.
[4] Jour. of Laryn., Dec., 1895.
[5] Ann. of Ophth. and Otol., Apr., 1896.
[6] N. Y. Med. Jour., Oct. 12, 1895.

sphenoidal disease subsequent to ethmoid disease. The ethmoid and sphenoid cells were opened with the gouge, and later with a $\frac{3}{16}$-in. drill. The sphenoidal disease lasted 13 days, followed by hemiplegia for 24 hours, indicating abscess at the base of brain, terminating in death. The author says he has seen only 2 cases of sphenoidal disease, both terminating fatally.

Dr. Ziem[1] contributed a most comprehensive paper embodying his experience in opening the antrum over 500 times. He finds that washing out the ostium maxillare is inefficient, painful, often impossible (see Figs. 157, 158), requiring cocain, which if used for a long time is liable to cause glaucoma and anosmia. Openings from the nose he disapproves of as less efficient than from the mouth, and because no improvements have been made in the operation. He advocates Cooper's method of drilling through the alveolus at the inner side of the teeth between the first and second molars or between the first molar and second bicuspid, followed by irrigation with a special force-pump.

Etiology of Postnasal Catarrh.—Freudenthal[2] repeated Aschenbrandt's experimental study on the amount of moisture absorbed by the air in passing through the nose, and decided that the air is not completely saturated. He attributes to the nasopharynx an important role in supplying moisture. In furnace-heated houses the dryness of the air causes irritation and swelling of the erectile tissues and occlusion of the nares. Normal secretion in the nasopharynx is prevented by dried secretion. The uncomfortable sensation causes one to breathe through the mouth even when the nares are free.

Catarrhal Diseases of the Nasopharynx and the Stomach.—Turk[3] discusses disease of the mouth, nose, and throat as etiologic factors in chronic glandular gastritis from bacteriologic examinations of the nasopharynx and the stomach. Specimens were obtained by the gyromele, a revolving sponge protected by a catheter or tube. In the anterior nares all forms of bacteria were found, but not colonizing; in the nasopharynx, when chronic inflammation existed, almost pure cultures were found. The lymph-cells from the vault of the pharynx act as phagocytes carrying infection to the stomach. He gives a number of cases in which treatment of the nares and nasopharynx relieved or cured gastritis by stopping infection.

Tuberculosis of the Nasopharynx.—De Mochowski[4] found that the mucous membrane of the nasopharynx was diseased in 21 out of 64 tuberculous patients examined. The 21 were mostly cases of acute miliary tuberculosis. [This is a remarkably large percentage. According to our observations, the nasopharyngeal mucous membrane is but seldom involved.]

Adenoid Hypertrophy.—Schadle[5] in a beautifully-illustrated article shows a variety of hypertrophies of the postnasal adenoid tissues. He characterizes as criminal the advice of some family physicians to let the child outgrow the difficulty.

[1] Jour. of Laryn., Oct.–Dec., 1895.
[2] Jour. Am. Med. Assoc., Nov. 9, 1895.
[3] N. Y. Med. Jour., Nov. 23, 1895.
[4] Gazeta lekarska, 1895, 2–4, quoted in Quart. Med. Jour., Jan., 1896.
[5] The Laryngoscope, vol. i. No. 1, July, 1896.

Adenoids and Incontinence.—Gronbeck [1] states that of 192 children with adenoids, 24 had incontinence; of 23 operated upon, 12 were cured at once; in 7 not operated on the incontinence disappeared when nasal breathing was reestablished. He thinks incontinence is due to CO_2 poisoning.

Results of Adenoids in Children.—Eustace Smith [2] states that the weakened state is due to a tendency to take cold on account of a susceptibility to changes of temperature. Gastric derangement with chronic dyspepsia and malnutrition follows. In neurotic and phthisical children operation is indispensable. The late Dr. Wilhelm Meyer [3] addressed the Copenhagen Medical Society on the antiquity and universality of adenoids. In Greenland, Dr. Helms reported 23 out of 60 children had the typical adenoid face, and only 16 were free from it. It is common among North American Indians and in South Americans of European descent. Semon [4] describes the symptoms, and advises early removal on account of health, mental development, and formation of the face, to prevent ear-complications, and to avoid increased danger of zymotic diseases in this condition. He reviews the different methods of operation, and recommends chloroform anesthesia sufficient to relax the muscles, but not to abolish the cough-reflex. He advises the use of small instruments in children. When associated with enlarged tonsils he recommends removal of the tonsils first, and operation on the adenoids after the throat is healed. [We advise complete anesthesia, a thorough operation, and removal of the faucial tonsils at the same time.] Arslan [5] reported 426 cases out of 4080 cases of diseases of the nose, throat, and ear; 69% had nasal obstruction; 37 had tonsillitis or pharyngitis; 59 had ear-complications; 110 were cases of suppurative otitis, and 142 had deafness with suppuration; 2 out of 6 deaf-mutes were improved by operation. Heredity was noted in 60%. The age of the patients was up to 40.

Stammering due to Adenoids.—Delavan [6] notes that certain defects of speech, such as mispronunciation of the consonants, depends upon obstruction in the normal resonating cavities, and that after removal of adenoids the defects have disappeared. Marked relaxation of the throat may cause the same defect, or even stammering, which may recur upon the relaxation of the soft palate due to an acute cold. Frequent gargling with cold water, head-tones, and falsetto-tones are advised to strengthen the levators of the palate.

Vertigo of Nasopharyngeal Origin.—Scheppegrell [7] describes a case in which vertigo was induced by retronasal catarrh. The patient, a man 24 years of age, for 7 years past has suffered from catarrh, but for the last 2 years, while making an attempt to clear his throat (nasopharynx) after breakfast, he gags and becomes dizzy, and has to take hold of a chair or other article

[1] Arch. f. Laryn., ii. p. 214; Am. Med.-Surg. Bull., Dec. 1, 1895.
[2] Lancet, 1895, i. p. 1298, quoted in Am. Med.-Surg., Bull., Oct. 1, 1895.
[3] Quoted by Med. Rec., Apr. 4, 1896.
[4] Brit. Med. Jour., quoted by Therap. Gaz., Jan. 15, 1896.
[5] Jour. of Laryn., Dec., 1895.
[6] N. Y. Med. Jour., Sept. 21, 1895.
[7] Med. News, May 23, 1896.

to prevent himself from falling. On two occasions he completely lost consciousness. Recently he has also had great pain over his right eye. A rhinoscopic examination showed a cartilaginous thickening of the septum into the right nostril and hypertrophy of the mucous membrane, causing marked stenosis. The septal thickening was removed and the hypertrophied mucous membrane reduced by the electrocautery. When the treatment was advanced the patient improved. Eight months later he reported having had no recurrence of either vertigo or pain.

Multiple Benign Papillomata of the Buccal Mucous Membrane.—Rasch[1] reports 2 cases in which a number of warty or condylomatous growths were found on the inner side of the lower lip and cheeks, varying in size from a flaxseed to a lentil. When touched or during mastication the larger bled easily. Applications of Paquelin's thermocautery destroyed the growth. In 1 case the child was in the habit of sucking the thumb, on which she had an old-standing wart.

Mouth-breathing and Salivary Calculus.—Guye[2] considers the formation of salivary calculus over the outside of inferior incisors a stigma of mouth-breathing. At that point the saliva becomes rapidly desiccated in mouth-breathers and the lime-salts are precipitated.

Xerostoma.—Riesman[3] reports a case in a woman of 38 with frontal and occipital headache, constipation, cramps, and a dry, pasty feeling in the mouth and throat, and burning pains in the tongue, also a burning sensation along the inferior maxillary nerve. The tongue was red, bare, and beefy, and studded with petechial hemorrhages on the under surface. Treatment failed to give any relief. Chappell[4] reports a case of his own, and also 1 of Robinson and 1 of Richardson. His patient, a woman of 46, gave a history of gradually-increasing dryness of the mouth, extending to the tongue, pharynx, larynx, trachea, and nares. The attacks were intensified during the menses at first; later the menses ceased. The parotid, submaxillary, and cervical glands became enlarged. The teeth decayed early in the disease and were removed. Thirst was constant, constipation extreme, and taste and smell impaired. Three months' treatment with nerve-tonics, potassium iodid, and pilocarpin produced some improvement. A year later death followed an attack of hemiplegia. Robinson's case was that of a woman who for several years felt constant pain in the roof of the mouth, which was relieved by anything causing a flow of saliva. She had gouty joints, which were relieved by colchicum and sodium salicylate. Pain extended to the mouth, jaw, and tongue, and was not relieved by potassium chlorate, strophanthus, or other remedies. Richardson's case was in a single woman of 60 who had suffered 4 years with nervous prostration. She had acquired the habit of taking camphor for headaches; her teeth decayed and dryness of the mouth supervened. The salivary glands were apparently unchanged. The urine was copious and of low specific gravity. Galvanism

[1] Quoted in Ann. of Ophth. and Otol., Oct. 18, 1895.

[2] Jour. of Laryn., July, 1895.

[3] Phila. Polyclinic, Mar. 7, 1896.

[4] N. Y. Med. Jour., Feb. 29, 1896.

and faradism of glands were without effect. Pilocarpin, gr. $\frac{1}{15}$ to $\frac{1}{10}$ every 2 or 3 hours, produced a fair amount of moisture in mouth.

Cleft-palate Operation.—Kraske[1] describes a new operation on a patient of 20 with extensive cleft. He cuts off the inferior turbinated bone, except the posterior $\frac{1}{3}$ in., with curved scissors. The turbinated is then used as a flap, and may be twisted and stitched to the margin in front or behind. The pedicle may be severed with the cold snare after from 10 to 14 days. [A very ingenious operation, but probably applicable only in selected cases.]

Acute Inflammation of the Lingual Tonsil.—Beausoleil[2] says acute inflammation is sudden, with cephalalgia, fever, pain on deglutition often below the lesion at the sternal fourchet or radiating to the ears. The tonsil is covered with white exudate and the disease ends in suppuration. Abscesses must be opened and iodin, trichloracetic acid, or resorcin applied to reduce hypertrophy. The galvanocautery may be necessary. Lewis[3] notes the common occurrence of diseases of the lingual tonsils and the symptoms—cough, fulness or tightness of the throat, dryness, and a rough, scratchy feeling. The lymphoid tissue and follicles may be found swollen and hypertrophied on one or both sides. Varicose veins may give rise to alarming hemorrhage. The tip of the epiglottis may be caught among the masses, causing a severe cough, which with the hemorrhage might seem to suggest serious pulmonary or laryngeal disease. The feeling of fulness in the throat may simulate globus hystericus. Solutions of iodin applied upon a swab with the tongue protruded in many cases cause atrophy of the enlargement; others require removal. Tompkins[4] notes that this form of lymphatic hypertrophy in the glossoepiglottic fossa is more common in middle life and in women. It is a chronic development. The most important symptom is a dry cough. By interfering with the movements of the epiglottis it causes fatigue in speaking or singing. Tickling sensations, suffocative attacks, and severe dyspnea have all been noted. He recommends

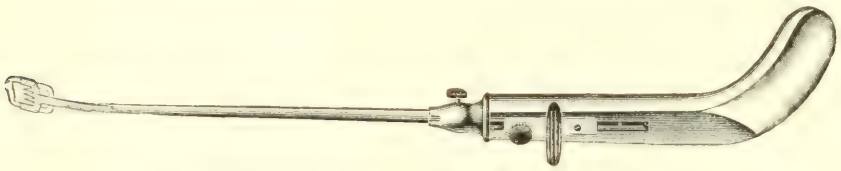


Fig. 159.—Myles' guillotine (Va. Med. Monthly, Dec., 1895).

removal of the growth in 2 or 3 sittings with the guillotine devised by Myles (Fig. 159), which leaves the throat in better condition than the galvanocautery, which is difficult. When removal does not relieve the cough, there will usually be found varicose veins on the base of the tongue. The largest of these should be destroyed by the galvanocautery.

Identity of Septic Throat-inflammations.—Semon[5] upheld the probable pathologic identity of acute edema of the larynx, edematous laryngitis,

[1] Beit. f. klin. Chir., xiv. ii. p. 577.
[2] Rev. de Laryn., Dec. 1, 1895.
[3] Laryngoscope, St. Louis, vol. i. No. 1, July, 1896.
[4] Va. Med. Monthly, Dec., 1895.
[5] Brit. Med. Jour., quoted in Pacific Med. Jour., Oct., 1895.

erysipelas of the pharynx and larynx, phlegmon of the pharynx and larynx, and angina Ludovici. In 1882 he had maintained that myxedema, cachexia strumipriva, and cretinism were due to the same lesion.

Bacteria of Tonsillitis.—Kelley[1] relates 4 cases of infection from a case of tonsillitis in which cultures showed only staphylococci and streptococci. Meyer[2] states that the secretion from noninflamed tonsils contains a coccus similar to streptococcus pyogenes, staphylococci, and leptothrix. Of 55 cases of inflammation, he found streptococci in 40, and believes them to be the cause in a large majority. He has never found pneumococci.

The Rheumatic Diathesis in Acute Tonsillitis.—Hope[3] questions the dependence of acute tonsillitis on the rheumatic diathesis, and claims that in a large clinical experience he finds cases answering to a rheumatic history exceptional, although specially examined by advocates of the rheumatic theory. If local acute manifestations of the rheumatic state occur, he would look for them in serofibrous tissues, rather than in mucofibrous tissues like the tonsils. In later life the tonsil becomes less and less subject to inflammation, while the gouty and rheumatic age is more confirmed. In suppurative periamygdalitis the course and termination point toward an infectious origin, with which a rheumatic connection is purely accidental. The average duration of 5 to 7 days for the amygdalitis of ordinary severity is little if any abbreviated by the early and vigorous use of antirheumatic remedies.

The Tonsils and Middle-ear Disease.—Ferrari and Garbini[4] attribute many cases of acute purulent otitis media following minor operations on the throat to infections from the tonsil. They advise disinfecting the mouth and nasopharynx and removing the tonsils by tonsillotomy, rather than destruction of hypertrophies by ignipuncture or galvanocautery, which is liable to open new channels of infection. Koehler[5] ascribes certain cases of tonsillar abscess to chronic suppurative middle-ear disease, the pus running into the pharynx through the Eustachian tubes. In one case a long series of abscesses in the tonsil ceased on proper treatment of the ear-disease.

Etiology of Lacunar Tonsillitis.—Coolidge[6] quotes Fränkel, who noted the cases of tonsillitis following intranasal operations, especially by the galvanocautery. He believes that tonsillitis arises from infections through lymph-channels from the nose and other regions more often than through the same channels by which the leukocytes escape. Chill may cause it by diminishing resistance or by causing catarrh, which affects the tonsil through the lymphatics.

Chancriform and Ulcerative Tonsillitis.—Mendel[7] describes an unusual condition which he had observed 6 times. It is a slowly-developing tonsillitis ending in a circular ulcer, more or less punched out, covered with a

[1] Phila. Polyclinic, 1896, in Am. Med.-Surg. Bull., June 20, 1896.
[2] Rev. heb. de Laryn., 1895, xvii. p. 179, in Am. Med.-Surg. Bull., June 6, 1896.
[3] N. Y. Med. Jour., Aug. 17, 1895.
[4] Arch de Otol., 1895, vol. iii. p. 293.
[5] Deutsch. med. Woch., 1896, in Am. Jour. of Med. and Surg., May, 1896.
[6] Boston M. and S. Jour., Nov. 28, 1895.
[7] Rev. de Laryn., Sept. 15, 1895.

dirty white coat and surrounded by a congested area. This remains stationary for a short time, but usually heals in about a week. From a chancre the condition is to be distinguished by the limited enlargement of the lymphatics and by its more rapid development. He believes it should be classed as a particular form of herpes, the vesicular form of which had passed unnoticed. [The rapid healing of this ulcer also distinguishes it from the specific one—a fact that should be borne in mind. The tendency of physicians, particularly those who have been only a few years in practice, is to look constantly for unusual diseases, and thus very often will marked cases of syphilitic ulceration go unrecognized for months.]

Chronic Disease of the Tonsils.—Wilson[1] says if hypertrophy is not a factor in the production of sore throat, and is apparently doing no harm, he leaves it alone. If the crypts alone are diseased, he cauterizes them. In cauterizing them he inserts the electrode diagonally, which also reduces the hypertrophy. For mycosis he recommends curetting and frequent application of sodium salicylate in alcohol. Kendal[2] believes that in every case of acute or chronic inflammation of the tonsils the salivary secretion will be found acid instead of alkaline, and that free doses of potassium carbonate or soda internally and locally applied will give most rapid relief. For cauterizing enlarged tonsils he recommends hydrochloric acid applied by a long capillary tube to the excretory ducts of the tonsils, 3 in each gland, at a sitting twice a week. This is painless and produces no inflammation or swelling. Five or six applications are sufficient for moderately enlarged tonsils. Nitric acid used in the same way will produce swelling and sloughing. Chromic acid he has abandoned after producing tetanus in a malignant case. Fenn[3] reported a case in which the tonsils were elongated till they touched the epiglottis, causing hysterical dyspnea. Removing a large piece from each tonsil gave immediate relief. Lichtwitz[4] has removed 400 tonsils with the hot wire. It is easy to do, and there is no danger of hemorrhage or of wounding the anterior fold. [Absence of hemorrhage makes this a desirable procedure in some cases, but the slowness of the operation and the pain would render it very objectionable when a general anesthetic was not used, and the severe reaction from the burn would add greatly to the patient's discomfort.]

Polypoid Hypertrophy of the Tonsil.—Lemariey[5] describes a case in which removal was easily effected by the hot snare. Under the microscope the growth appeared to be tonsillar tissue, except that under the mucous membrane connective tissues were so greatly developed at points as to resemble a true sclerosis. These growths may assume either a fibrous or lymphoid type.

Tuberculosis of the Tonsils.—Stewart[6] gives a case as one of ordinary enlargement of the tonsils, with pharyngeal adenoids associated with post-scarlatinal otorrhea and enlargement of the cervical lymphatic glands, in a child 10 years old. Section of lymphatic tissue from the tonsils showed

[1] N. Y. Med. Jour., Apr. 15, 1896.
[2] Quoted in Ann. of Ophth. and Otol., 1896.
[3] Pacific Med. Jour., June, 1895.
[4] Ref. Quart. Med. Jour., Jan., 1896.
[5] Ann. des Mal. de l'Oreille, May, 1895.
[6] Brit. Med. Jour., May 4, 1895.

numerous tuberculous giant-cell systems, but no tubercle-bacilli. Some enlarged cervical glands removed subsequently showed typical tuberculosis in various stages. Dieulafoy[1] found tuberculosis in 13% of cases with simple hypertrophied tonsillar tissue, and in 20% of adenoids. He notes that faucial and lingual tonsils can be inoculated by swallowing tuberculous material.

Syphilis of the Tonsils.—Fournier[2] claims that chancre of the tonsil is far more frequent than it is supposed to be—that he himself had for a long time mistaken it for other lesions. Boeck calls it the most common of all extragenital chancres, and accounts for its frequency in Norway by the great number of poor families using the same vessel for eating, some of them having but one spoon for the whole household.

Pharyngotherapy.—Heller[3] notes the frequent infections in this region, and recommends nasal and nasopharyngeal irrigation in erysipelas, diphtheria, pertussis, scarlatina, measles, rötheln, typhoid, etc., either with sterilized water or some mild antiseptic. He says: 1. A majority of infectious diseases, excepting cholera and dysentery, are inhalation-infections; 2. The first localization of disease is in the upper air-passages; 3. This region forms a situation where the incubation-period is completed; 4. Absorption into the blood and lymphatic current takes place from here. [Undoubtedly useful in a few cases where nonirritating solutions are employed, and sufficient care is exercised to prevent entrance of the solution into the Eustachian tubes, but should not be employed indiscriminately.]

Fatal Pharyngeal Hemorrhage.—Brewer[4] reported a case diagnosed as quinsy with repeated severe hemorrhages, from the effect of which the patient died.

Syphilitic Adhesions of the Pharynx and Soft Palate.—Lieven[5] advises that after separating syphilitic adhesions the posterior nares be powdered with europhen and packed with europhen gauze for 10 days. Then a rubber bag is passed into the nasopharynx with a tube extending through the nares, by which the bag is distended with air. This may be worn for several hours a day at first.

Mycosis of the Throat and Nose.—Wright[6] contributed 4 cases. In the first, a young girl, the tonsils, pharynx, and nasopharynx were covered with numerous mycelial threads showing lepthothrix buccalis. All the growths disappeared within 2 weeks, the patient meantime using an alkaline douche. A few plugs in the tonsils were touched several times with solution of iodin. He condemns surface applications. A case of mycosis is reported in the Virginia Medical Monthly for July, 1895, in which an attack of pneumonia was followed by complete disappearance of numerous mycotic masses without local treatment. [We have known them to disappear even without the intervention of pneumonia or other disease, and without treatment.]

[1] Bull. de l'Acad. de Méd., No. 1795; ref. Am. Med.-Surg. Bull., Oct. 1, 1895.
[2] Quoted in Am. Jour. of Med. Sci., Dec., 1895.
[3] Deutsch. Arch. f. klin. Med,, Mar. 13, 1895.
[4] Ann. of Ophth. and Otol., Apr., 1896.
[5] Münch. med. Woch., No. 21, 1895.
[6] N. Y. Med. Jour., July 6, 1895.

Chronic Spasm of the Pharynx.—Bond[1] noted rhythmic movements of the back of the pharynx to the left and returning to the middle line, the soft palate being drawn up at the same time and relaxed. No clicking sounds were heard by the patient or others.

Treatment of Pharyngitis.—Burgess[2] reports a case in which repeated severe hemorrhages occurred from a sulcus in the tonsil. Treatment by ergotin and ice was inefficient. Blondian[3] in the dry form of pharyngitis uses friction with a 30% solution of sodium sulphoricinate. Under cocain the mucous membrane may be scarified, and the application then made to penetrate to submucous tissues. He finds that it restores the normal secreting function.

Retropharyngeal Abscess.—Levrey and Ghika[4] report a case of retropharyngeal abscess in a child of 6 months. Median incision gave exit to pus, which escaped from the mouth and nose, the head being inclined forward. The child ceased breathing, although on autopsy no pus was found in the larynx, trachea, or bronchial tubes. Koplik[5] reviews an experience of 77 cases within 6 years, a majority of which were infants under 2 years of age and most frequent during the period of suckling. He divides the subject into —1. Acute retropharyngeal abscess; 2. Chronic; 3. Septic. He denies the possibility of an acute idiopathic variety, and maintains that they are all due to infection through the lymph-channels of the adjoining structures. Willy Meyer[6] advocates the incision of nonperforating abscess from the side of the neck on antiseptic principles. In cases of septic origin irrigation and drainage are facilitated. In tuberculous cases curetting and packing with iodoform-gauze are made possible. He describes Burckhart's operation—an incision at the inner border of the sternomastoid at the level of the larynx, dissecting to the inner side of the common carotid, and incision of the thickened mass beside the lower end of the pharynx, enlarging the opening with the dressing-forceps. He describes 4 cases of this operation, but admits that the preference between this and Chiene's incision behind the sternomastoid is undecided. Hand[7] describes a case following parotitis in a boy of 22 months. The abscess was 3 weeks developing, and was opened by direct incision from the pharynx.

Cervical Tubercular Adenitis.—Ingals[8] recommends guaiacol and carbonate of creasote internally, with phenol and lactic acids injected into the suppurating glands. He related the case of a man of 33 who developed an adenitis during treatment for phthisis; 4 injections of the acids within 9 weeks, after withdrawing the contents of the abscess, caused complete healing. Injection was begun with 3% of phenol and 20% of lactic acid. The strength of subsequent injections was gradually increased to 5% of phenol and 40% of lactic acid; the phenol prevented severe pain.

Thyroid Cyst.—Brown[9] enucleated 2 cysts in young women after emptying the contents through a free incision.

[1] Jour. of Laryn., Mar., 1896.
[2] Dublin J. M. Sci., Feb., 1896.
[3] Am. Med.-Surg. Bull., Feb. 1, 1896.
[4] Rev. de Méd. et de Thérap. infant., Nov., 1895.
[5] N. Y. Med. Jour., Apr., 4, 1896.
[6] Am. Med.-Surg. Bull., Apr. 4, 1896.
[7] Arch. of Ped., July, 1895.
[8] Internat. Med. Mag., June, 1896.
[9] Lancet, Sept. 21, 1895.

Goiter.—Morris[1] has treated 55 cases in the past 2½ years. The soil in his district is excessively chalky, and the water-supply is obtained from deep wells in the chalk. The author attributes goiter to the presence of calcium and magnesian carbonate in the water. People living on the hills and using rain-water were not affected with the disease. Munson[2] in a report on goiter among the Indians in the United States found 1823 cases among the 77,000 inhabitants of goitrous tracts. He concludes—1. There is a strong racial predisposition to goiter among Indians; 2. It is a distinctly localized disease; 3. It does not appear to be caused by high altitude, climate, or water containing an excess of calcium salts; 4. It is favored by unsanitary conditions, constitutional depression, and excessively nitrogenous diet; 5. Hereditary influence is strongly marked; 6. Cretinism and Graves' disease are rare; 7. The tumors are smaller than among the whites. Mikulicz[3] reports 10 cures of goiter and 1 of Graves' disease. He gave raw chopped sheep thymus in from 10- to 25-g. doses on alternate days. In 6 cases much diminution in size occurred within 2 or 3 weeks, without the malaise, loss of flesh, diuresis, or rapid pulse reported in thyroid-feeding. In the case of Graves' disease in a woman of 44 there was imminent suffocation, with cyanosis and rapid pulse, all relieved by the injection within 6 weeks of 375 g. of thymus.

Thyroid Extracts and Desiccated Thyroids.—Ingals and Ohls[4] from an analysis of 50 cases find that swelling was reduced in 38, not affected in 11, no report in 1. These remedies produce marked physiologic effects upon the nervous and circulatory systems, as indicated by headache, dizziness, pains in other portions of body, great weakness, and by flushing of the face and rapidity of the heart's action. Some of these symptoms usually occur when the daily dose corresponds to 1½ or 2 entire thyroid glands of the sheep. Desiccated glands appear quite as active as the liquid extracts, and are more stable. Internal administration appears quite as effective as hypodermic use. They recommend 2-gr. doses of the desiccated gland 3 times a day. Loss of weight is so variable that it is probably due to disturbance of the digestive organs. Cystic growths in the thyroid gland are probably not influenced.

Graves' Disease.—Pribram[5] has noted gradual subsidence of the cardinal symptoms in Graves' disease for long periods. In such cases complete recovery may be claimed. These facts should be remembered when the operative or medicinal treatment of Graves' disease is under consideration. Singer[6] reports a case of scleroderma in which the right half of the thyroid gland was found greatly atrophied during life, and, postmortem, both lobes showed marked sclerotic changes. He suggests, therefore, that Graves' disease, myxedema, and scleroderma are related. Ingals and Ohls[7] found that desiccated thyroids caused rapid reduction in the size of the gland in this disease, but the remedy aggravates the heart-symptoms, and it must therefore be given care-

[1] Brit. Med. Jour., July 6, 1895.
[2] N. Y. Med. Jour., Oct. 26, 1895.
[3] Berl. klin. Woch., Apr. 22, 1895.
[4] N. Y. Med. Jour., Sept. 7, 1895.
[5] Wien. klin. Rundsch., 1895, No. 44, quoted in Am. Jour. Med. Sci., Apr., 1896.
[6] Quoted in Am. Jour. Med. Sci., Feb., 1896.
[7] N. Y. Med. Jour., Sept. 7, 1895.

fully. The exophthalmos was not appreciably affected. Scholz[1] has noted the excretion of phosphoric acid in the feces during the ingestion of thyroids. In Graves' disease the amount excreted in the stools amounted to tenfold the normal, as compared with an increase of 25% only in a healthy person. He concludes, therefore, that the thyroid gland has an important influence on the metabolism of phosphoric acid, and suggests that the failure in the function of the thyroid causes retention of phosphoric acid, while the morbidly increased activity as in Graves' disease caused increased excretion. Kocher, by similar reasoning, recommended the internal use of sodium phosphate in this condition.

Partial Thyroidectomy.—Tuffier[2] gives a case of severe exophthalmic goiter with cystic enlargement of the right lobe of the thyroid in a woman of 27. Iodin-injections, tapping, and electricity caused no improvement. The exophthalmos and other symptoms disappeared after partial thyroidectomy.

Foreign Bodies in the Esophagus.—Allen[3] studied 82 cases recorded in the Surgeon General's office. As to the relative importance of symptoms, he divides the esophagus into four portions. The voice is harsh, metallic, or chirping, while stridor is less frequent than one might expect. When the foreign body is lodged in the neighborhood of the glands of the pharynx and mouth excessive mucous formation takes place. Primary hemorrhage is not usually important, but secondary hemorrhage indicates ulceration or injury of the large vessels. Anxiety is marked. Belching is a rare but grave symptom; pain is variable and referred to the cervical vertebræ, the epigastrium, or to the base of neck. Convulsions occur occasionally. Emphysema occurs in 15% of cases. Various reflex neuroses have been noted.

Fracture of the Hyoid.—Ramsden[4] gives a unique case of indirect fracture of the hyoid bone from a fall on the head. There was hemiatrophy of the tongue, with difficult speech and swallowing, which improved for 8 years. Fibrous union of the hyoid occurred.

The Epiglottis.—Barrett[5] quoted Prof. Anderson Stuart of Sydney, whose patient had an injury of the neck exposing the epiglottis and larynx. During deglutition the epiglottis remained erect, and the closure of the larynx was effected by the approximation of the true and false vocal bands. The epiglottis probably played the part simply of a shute which directed the food toward either side in its passage down the dorsum of the tongue. [The wound of the neck doubtless interfered with the normal action of the parts; therefore this observation should not be considered as conclusive.]

The following case is from an editorial in the Virginia Medical Monthly for July, 1895: A patient felt a bone in the throat after eating fish; 4 days later an abscess formed on the anterior surface of the epiglottis, and was supposed to be the cause of the sensation. The abscess was opened, and the fol-

[1] Quoted in Am. Jour. Med. Sci., Feb., 1896.

[2] Lancet, quoted in Am. Med.-Surg. Bull., July 15, 1895.

[3] N. Y. Med. Jour., Aug. 17, 1895.

[4] Lancet, 1894, ii., quoted in Am. Med.-Surg. Bull., July 1, 1895.

[5] Austr. Med. Jour., July 20, 1895.

lowing day another small abscess was opened and a solution of silver nitrate applied without relief. Further examination then revealed a small fish-bone projecting from the base of the tongue, and it was removed by the wire snare passed through a curved cannula with flattened end.

Rosenbaum [1] reports a case in which Israel removed the entire epiglottis for malignant disease from a man of 64, with recovery. Within 3 weeks he could swallow solid food and speech was not affected. Incision was made close to the lower border of the hyoid bone to avoid injury to the superior laryngeal nerve.

Kirstein's Direct Laryngoscopy.—Bruns [2] described the new method of examining the larynx by direct inspection (see Figs. 160, 161), and said

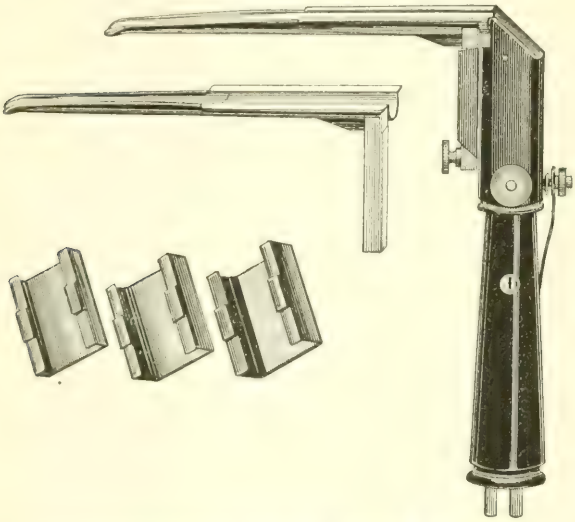


FIG. 160.—Kirstein's laryngoscope (Jour. Am. Med. Assoc., Feb. 8, 1896).

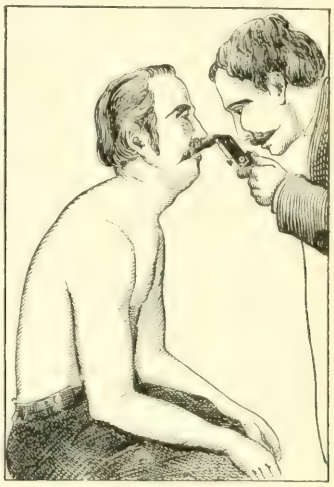


FIG. 161.—Showing distinctly the position of neck and head during examination (Jour. Am. Med. Assoc., Feb. 8, 1896).

that it can be used in about one-half the cases, anatomic conditions not permitting it in others. Growths can be removed endolaryngeally by this means, and, while it is only exceptionally useful in adults, the writer found that it was valuable in most cases of children. Children during the earlier years may be held during the operation, while adults may be given short narcosis. [This must generally be much less satisfactory than the usual method, but in operating on children under an anesthetic it would appear worthy of trial.]

External Examination of the Larynx.—Gerhardt [3] gives the diagnostic points to be noted by manipulation of the larynx and front of the neck. In severe dyspnea from narrowing of the caliber of the larynx the latter manifests strong movements synchronous with respiration, while in tracheal stenosis

[1] Arch. f. klin. Med., 1895, xlix. p. 773, quoted in Am. Med.-Surg. Bull., Aug. 15, 1895.
[2] Berl. klin. Woch., Feb. 24, 1896; ref. Jour. of Am. Med. Assoc., Feb. 8, 1896.
[3] Arch. f. Laryn., vol. ii., quoted in Am. Med.-Surg. Bull., Mar. 14, 1896.

it is generally quiet. In the former case the head is generally bent backward, while in the latter the chin approaches the sternum. In persistent stridor the finger placed lightly on the cervical portion of the trachea feels a corresponding whirring, which in laryngeal obstruction is more often inspiratory, or at least stronger in inspiration, while in deep-seated tracheal trouble the after-felt whirring is more often expiratory.

X-Rays and the Larynx.—Wagget[1] reported that together with Rowland he had been enabled by the use of the cryptoscope to not only locate foreign bodies in the larynx and esophagus, but to see the relative position of a probe and the foreign body. MacIntyre[2] in a preliminary note on the use of the Röntgen rays states that with an App's coil and Newton's tube he has seen shadows of the vertebral column, ribs, clavicle, and scapula. A photograph of the larynx shows the base of tongue, hyoid bone, thyroid and cricoid cartilages, epiglottis, and other details. Foreign bodies and ossification of cartilages have been detected in dead bodies. With the cryptoscope he has seen a coin swallowed 6 months before lying at the level of the third dorsal vertebra. For examination of the antrum he uses Crookes' tube outside, with a special cryptoscopic tongue-depressor.

Function of the Laryngeal Ventricles.—Hodgkinson[3] states that the laryngeal ventricles act as receptacles for dust and mucus cleared off the vocal cords by their vibration. The observed passage of mucus, etc. from the ventricles downward into the air-passages proves that blood, pus, etc. coughed up from these passages may be of other than pulmonary origin. The clearing of the cords and ventricles by the ordinary act of deglutition helps to explain the clearing of the voice by eating, drinking, etc.

Laryngeal Ventricle-prolapse.—Jones'[4] patient, a male of 35, after overstrain of the vocal cords outdoors felt sudden impairment of the voice, quickly disappearing, but returning in a fortnight. Examination showed a reddish mass resting on the left vocal band. The ventricle prolapsed gradually when the attachment to the thyroarytenoid muscle and connective tissue gave way. The mass could be replaced by pressure. He removed it by galvanocautery, with a shield to protect the vocal band.

The Cigaret Habit and Laryngitis.—Mulhall[5] ascribed the evil effects of cigaret-smoking to nicotin alone, and its pleasure to irritation of the laryngeal and tracheal sensory branches of the pneumogastric. Locally, it never causes throat-diseases, though it may aggravate them either locally or by its constitutional depressing effects. On youth he finds it invariably harmful.

Laryngitis Sicca.—Wright[6] quotes M. Molinie,[7] who says that laryngitis sicca may be primary and developed independently of any lesion of the nose and nasopharynx. He attributes it to the coccus of Loewenburg. Wright attributes all chronic laryngitis to disease of the air-passages above,

[1] Jour. of Laryn., June, 1896.
[2] Ibid., May, 1896.
[3] Ibid., Apr., 1896.
[4] Med. News, Feb. 2, 1895.
[5] N. Y. Med. Jour., Nov. 30, 1895.
[6] Ibid., Feb. 8, 1896.
[7] In Rev. de Laryn.

except those due to alcoholism, overuse of the voice, or rheumatism. He has never seen tracheal ozena without ozena and atrophy of the nasal mucosa. He believes that the crusts are dried secretions which come from above in semifluid form. [We have seen tracheal ozena with normal nasal passages.]

Laryngeal Ulcers in Typhoid Fever.—Bergengrün[1] noted marked swelling of the epiglottis, edema of the arytenoid cartilages, and both vocal bands almost entirely destroyed, by deep ulcers. From study of this case he concludes that the laryngeal complication is not due to decubitus, but to a secondary infection of the larynx as advocated by Rokitansky. Kanthack[2] read a paper written by himself and Drysdale, based on 61 postmortems from 1890 to 1895. Ulceration was found in about 26%, generally over the tip and edges of the epiglottis and in the neighborhood of the processus vocalis. In 14 cases the epiglottis alone was affected in 4, the larynx proper in 7; both larynx and epiglottis once; in 2 cases the soft palate or pharynx was ulcerated, as well as the epiglottis. In many or most of the cases the patient was in the typhoid state, which predisposes to ulceration, the laryngeal mucosa being then readily injured and forming a portal for pyococci rather than typhoid-bacilli. Typhoid fever probably renders the laryngeal mucosa more vulnerable to attacks of the tubercle-bacillus.

Laryngeal Fractures.—Scheff[3] describes the symptoms including general subcutaneous emphysema. Crepitation is difficult to distinguish from that obtained by pressing the normal larynx against vertebræ. The thyroid cartilage is fractured more often than the cricoid. The arytenoids and vocal membranes may be involved. The partial ossification of middle age predisposes.

Lepra of the Larynx.—Bergengrün[4] gives a microscopic description of 9 cases, in all of which the epiglottis, the true and false vocal bands, were involved. The epithelium was swollen and covered with nodules. The cartilages appeared normal, but the perichondrium was irritated and sometimes swollen.

Polypoid Lipoma.—Farlow[5] reported a male of 66 with a growth of 15 years' duration. The growth was attached to the lower pharynx, and by coughing with the head held downward it would extend ½ in. out of the mouth, and part of it would drop between the vocal bands. There was no recurrence within 3 months.

Edema of the Larynx.—Levi and Laurens[6] described a patient, a male of 34, with intense dyspnœa and cyanosis, edema of the epiglottis and arytenoepiglottidean ligaments. Cure followed leeching the front of the neck.

Stenosis of the Larynx.—Massei[7] gives a review of operations with the following conclusion: In cases of severe stenosis in which tracheotomy is clearly indicated, but time would not allow of its performance, temporary in-

[1] Quoted in Ann. of Ophth. and Otol., Apr., 1896.

[2] At a meeting of the Laryngol. Soc. of London, Feb. 12, 1896.

[3] Wien. med. Woch., Apr., 1896.

[4] Arch. f. Laryn., quoted in Am. Med.-Surg. Bull., Nov. 1, 1895.

[5] N. Y. Med. Jour., Nov. 16, 1895.

[6] Arch. gén. de Méd., Dec., 1895.

[7] Jour. of Laryn., ix., 1895, p. 567, quoted in Am. Med.-Surg. Bull., Jan. 18, 1896.

tubation, provided the form of the stricture allows of the passage of the tube, will render the operation easier, not only by removing the immediate danger of suffocation, but also by fixing the larynx and quieting the circulation.

Intubation.—Variot[1] gives the record of 4 cases in which, after intubation, the metallic tube was accidentally swallowed. The author maintains that, notwithstanding their size, the tubes when they are swallowed may pass through the entire digestive tract and be eliminated without causing any trouble. In children dead of diphtheria, tubes have been found in various parts of the gastrointestinal tract, which tubes were doing no harm and would eventually have passed. Out of 857 cases of diphtheria treated by Variot, 122 were intubated, although the introduction of the vapor-room has greatly diminished the necessity of the procedure. Of the 4 cases in which the tube was swallowed, 1 passed it in 2 days, and 1 passed it in 3 days, while the other 2 perished because of the disease and not because of the tube. The autopsy disclosed the tube in 1 case in the stomach, and in the other case in the cecum. Mayo[2] reports a very interesting case in which an intubation-tube slipped into the bronchus and was removed by a tracheotomy, the patient recovering. In this case the tube was inserted without any difficulty. Mayo used the size of tube advocated by O'Dwyer for children from 4 to 6 years of age. At the end of the third day the condition had so much improved that the tube was removed. Three hours later he was forced to reinsert the tube because of dyspnea. Again in 2 days the tube was removed, but 6 hours later it was again reinserted because of threatened suffocation. After the tube had remained about 42 hours, it was observed that the breathing was difficult and very noisy. Mayo introduced his finger and was unable to feel the head of the tube, and he detected the fact that swelling and edema of the larynx and adjacent structures had disappeared. Reaching far over into the esophagus, the head of the tube could be felt in the trachea below the cords. The trachea was compressed about the tube and forced up. The extractor was introduced into the larynx, and the tube was held forward by a finger behind the larynx. During attempts at extraction the tube was felt to slip down into the bronchus. Suffocation seemed imminent, and it became evident that the tube must be at once removed. The incision for a low tracheotomy was made. The trachea was opened, the assistant held the child up by the feet, and artificial respiration was made. A probe was introduced, and the tube was discovered in the right bronchus. The probe loosened the tube, and the manipulation brought on a cough which forced the tube down to the incision, through which it was easily withdrawn. After 15 minutes respiration became natural. The child soon returned to consciousness, and a tracheotomy-tube was inserted and left in place for 6 days. In spite of a septic bronchopneumonia, the child made a good recovery. [This case is in every way creditable to the skill, courage, and persistence of the surgeon.] Strong[3] reviews his experience in 100 intubations, in which he introduced the tube about 300 times. To intubate, have the child

[1] Jour. de Clin. et de Thérap. infant., May 30, 1895.

[2] Med. Rec., Nov. 2, 1895.

[3] Chicago Med. Recorder, Sept., 1895.

sitting upright with head held back, so that the mouth looks straight upward. In this position he seldom fails in the first attempt to introduce the tube. After intubation he confines the diet to milk and water from a nursing-bottle, the patient lying on the back with the head lower than the body. Since feeding the patient as described he has had 56 cases of intubation in diphtheria with 26 recoveries. [The position recommended for the patient when intubation is to be done differs from that generally recommended, and deserves trial, though we have had much more difficulty in doing the operation when the head was thrown backward more than 20° from the axis of the body.] Bartlett[1] reports 61 cases intubated, with 20 recoveries. Of patients over 3 years old, 47.8% recovered.

Wetherla's Extractor.—Wetherla[2] describes an electromagnetic tube-extractor. When attached to cautery batteries of 6 volts the lifting power is entirely sufficient. The tube should be of iron or the head may be of iron and the body brass. [Although this instrument can be used satisfactorily if properly made and connected with a suitable battery in good working order, it seems to unnecessarily complicate a simple operation.]

Multiple Laryngeal Papillomata.—Von Navratil[3] relates 42 cases of children whose larynges were extensively filled. He advises complete removal in every case to avoid recurrence if possible. If growths are single or small, they can be removed by intralaryngeal curetting, or, if dyspnea is urgent, after tracheotomy. Extensive growths require laryngofissure and thorough removal of masses, both to restore speech and to prevent recurrence. If dyspnea was not urgent, he began removal with Storck's guillotine, finishing with the sharp spoon, without narcosis, and before cocain without a local anesthetic. Recurrence always took place, requiring a repetition of the operation at intervals for a period of from 1 to 4 years till power of recurrence was exhausted. Recently he had done tracheotomy, followed by intralaryngeal removal, and on recurrence he removed them from above and also through the tracheotomy fistula. In 15 adult cases on recurrence after curetting he performed laryngofissure and removed growths without recurrence. Kanthack[4] exhibited before the Laryngological Society of London the larynx of a child that had died suddenly of asphyxia. The whole internal surface of the larynx was filled with a dense papillomatous growth below the band, and even below the tracheotomy-wound. The growths were covered by a thick layer of squamous epithelium. Delavan[5] said that at least 3 cases have been cured by frequently-repeated sprays of absolute alcohol. The applications are easily made, are nonirritating, and apparently are not followed by recurrence.

Benign Tumors of the Larynx.—Rousseaux[6] from experience in 2 cases concludes that the galvanocautery is applicable to the larynx, contrary to

[1] Chicago Med. Rev., July, 1895.
[2] Am. Jour. of Obstet. and Dis. of Women and Children, Sept., 1895.
[3] Berl. klin. Woch., Mar. 9, 1896.
[4] Jour. of Laryn., Jan., 1896, quoted in Ann. of Ophth. and Otol., Apr., 1896.
[5] Am. Med.-Surg. Bull., Mar. 7, 1896.
[6] Rev. Int. de Rhin., v., 1895, p. 61.

the view generally held. Especially is it indicated in sessile benign tumors of small dimensions. The cautery-point must be smaller than the neoplasm, and applied near the center of the latter for not more than a second. The heat should be dull-red only. [The cautery, accurately applied, with a sufficient interval (14 to 20 days) between operations, may be very useful in selected cases.]

Lupus of the Larynx and Palate.—Stabb[1] presented a case of this disease to the Laryngological Society of London. McBride had used the galvanocautery and chromic acid successfully in such cases. Semon preferred scraping and lactic acid when the parts were accessible, but feared that stenosis might follow scraping the larynx. He had treated some with arsenic and cod-liver oil without local remedies. Stewart's case improved under arsenic alone.

Myxoma.—Bond[2] reported that he had removed a cyst-like myxoma from the middle of the right vocal band. The patient had been hoarse 12 years, and the voice was much improved by the operation. Pure myxomas of the band are very rare. Thomson had removed a similar growth.

Cystic Tumor.—Mackenzie[3] described a case in a man of 67. The cyst was pear-shaped and attached near the anterior commissure, lying upon the left vocal band, which had been absorbed from pressure. It was removed with the forceps. The author reported a similar case in a woman of 80. There was no recurrence.

Carcinoma.—Mokes[4] reports a case, with a photograph of the patient taken 3 years after operation. The patient still wears a tracheotomy-tube, most of the time for fear of stenosis. The voice is very good in view of the fact of the existence of but one vocal band, and there is no return of disease. Lack,[5] in a very able paper, points out the danger of infection of healthy tissues during operations on malignant growths. To show the possibility of a malignant growth infecting healthy tissue in contact with it, he quotes 10 cases of carcinoma in various organs. Another series follows of 11 cases, in which the secretions of carcinomata were in various ways brought in contact with healthy tissues at a distance, with development of secondary growths. Fourteen more cases indicate clearly the danger of infection during operations, the recurrence taking place in operation-wounds rather than in the lymphatics. In operations on the larynx he condemns splitting the thyroid cartilage when the neoplasm is liable to be cut, and emphasizes the importance of removing the malignant growth entire, cutting through healthy tissues only. When cutting into the growth is unavoidable, he uses pure phenol to cauterize the field of operation.

Malignant Disease of the Larynx.—Delavan[6] says epithelioma generally arises in the ventricular band, but may begin in the vocal band, the epiglottis, or the aryepiglottic fold. An early sign is infiltration of muscles in the vicinity, resulting in impairment of motion, with hoarseness. The disease

[1] Jour. of Laryn., May, 1896.
[2] Ibid., May, 1896.
[3] Lancet, Oct. 7, 1895.
[4] Ann. of Surg., Dec., 1895.
[5] Lancet, June 15, 1896.
[6] N. Y. Polyclinic, July 15, 1895.

extends backward. The cervical glands under the anterior border of the sternomastoid muscle are earlier involved in the extrinsic variety. Semon[1] reviews the histories of 103 cases; 79 were in men and 55 intrinsic. He notes the importance of hoarseness as the earliest symptom, and the vocal bands as the most common point of origin. He performed 3 partial extirpations of larynx, with 1 death; 4 thyrotomies with resection of cartilage, no death; 4 thyrotomies with removal of soft parts, 2 deaths; 1 subhyoid pharyngotomy, 1 death; recoveries, 58.3%.

Potassium Iodid in Doubtful Diagnosis.—Rice[2] advises the use of potassium iodid in doubtful cases of disease of the larynx, and says we might continue to cite cases of most varied pathologic appearances—ulcerations which seem to be tuberculous, small growths which were apparently benign, large swellings with every appearance of malignancy, afterward proved to be specific or, at least, disappeared through the effect of potassium iodid.

Laryngeal Tuberculosis.—Schadewald[3] reported a case with limited pulmonary tuberculosis, and 2 healed and 1 existing laryngeal ulcer which healed during treatment by rubbing **creolin** into the body vigorously. The total amount used was 7 oz. He advises incorporating lanolin with it to prevent adhesions to the linen, which would cause irritation. Bergengrün[4] reports 7 cases of tuberculous laryngitis cured by general treatment and **lactic acid** and **iodoform** locally. Newman[5] exhibited 2 cases of primary tuberculosis of the larynx cured by spraying with a solution of **iodoform** in ether following a spray of cocain. A large number of other cases in which he used the same treatment obtained notable relief. To be efficient the iodoform treatment must be adopted before ulceration takes place. Spengler[6] concludes that **parachlorphenol** applied to the larynx directly, or in 10% solution in a spray, will induce cicatrization of tuberculous ulcers and resorption of tuberculous infiltration without irritation. Dissolved in glycerol, it has a local anesthetic action lasting several hours. It also has a favorable action on lupus and may effect a cure. Whalen in a personal communication reports a most interesting and successful experience in the use of **guaiacol** applications. The patient was a male of 30, who developed incipient pulmonary tuberculosis in 1891, which yielded to 10 months' treatment with creasote and syrup of hypophosphites with maltine. A year later he contracted a severe cold, followed by return of lung-symptoms and laryngitis, for which the larynx was sprayed with solution of zinc sulphate, gr. 2 to 15 to the ounce, for 2 months. Upon the appearance of tumefaction of the arytenoids and infiltration of the ventricular bands a spray of iodin terchlorid was made daily, beginning with .25%, increasing to 1% within 2 months. On the occurrence of ulceration of the left vocal band applications of lactic acid in varying strength were made,

[1] Lancet, Dec. 15–29, 1894, quoted in Am. Med.-Surg. Bull., Sept. 1, 1895.
[2] Med. Rec., N. Y., July 6, 1895.
[3] Berl. klin. Woch., 1895, No. 24, p. 529, quoted in Am. Jour. Med. Sci., Sept., 1895.
[4] Arch. Laryn., ii. p. 2, quoted in Quart. Med. Jour., Jan., 1896.
[5] Quoted in Jour. of Laryn., Mar., 1896. [6] Quoted in Med. News, Nov. 30, 1895.

the local conditions becoming more unfavorable for 3 weeks. Then he used a spray of guaiacol in oil of sweet almonds, beginning with 20% and increasing to 50%. This was followed in a few weeks by gradual improvement, the ulceration healing completely in less than 2 months; some swelling remained for about 10 months. The lung-symptoms were arrested, and at the same time the patient's health was greatly improved. Examination in March, 1896, showed no extension of lung-disease, though the sputum contained numerous tubercle-bacilli. The larynx is normal, except partial destruction of the left vocal band, the remaining portion being redder than the opposite band. Some hoarseness remained, but during the whole period the patient had not lost a day from his business, which requires many hours of talking daily.

Surgical Treatment.—Gleitsmann[1] gave the following indications for curetting: 1. In cases of primary tuberculous affections without pulmonary complications; 2. In cases with concomitant lung-disease which is either in the incipient stage or has at least not progressed to softening and hectic conditions; 3. It is best adapted for circumscribed ulcerations, and especially infiltrations of the larynx. 4. For the dense, hard swelling of the arytenoid region, the ventricular bands, the posterior wall, for tubercular tumors and affections of the epiglottis; 5. In advanced lung-disease, with distressing dysphagia resulting from infiltration of the arytenoids, curetment is justifiable as the quickest means to give relief. Contraindications are—1. Advanced pulmonary disease and hectic; 2. Disseminated tuberculous disease of the larynx, leaving little or no healthy tissue; 3. Extensive infiltrations, producing severe stenosis when tracheotomy is indicated. It is not to be recommended in nervous, distrustful patients, who lack the necessary perseverance or confidence in their physician. Gleitsmann[2] reported 12 cases which he had curetted. Of these 3 were dead, 5 in statu quo or had lost the improvement previously gained, and 4 are without recurrence of the laryngeal disease from 6 to 10 months. He also referred to a case he had cured 7 years before with the curet, galvanocautery, and lactic acid. Krause[3] said it was important to remove all diseased tissues, and advised applications of lactic acid after operation, to promote healing. He claims that it relieves but does not cure patients. Heryng said that tubercle of the larynx may heal by itself without local treatment. Surgical operations are indicated in most recent cases. Healing of deep ulcers is effected quickest by scraping or removal of tubercular tissues. He applies a 1% or 2% solution of pyoktanin to prevent infection.

Hysteric Aphonia.—Kennel[4] states that sudden application of ethyl chlorid to the nape of the neck, thus freezing a spot the size of a shilling, never failed to relieve attacks in 2 patients. In Merrick's[5] case after 8 months of whispering a woman recovered her voice suddenly, and found it impossible to whisper thereafter, any effort to phonate resulting in distinct tone.

[1] N. Y. Med. Jour., Oct. 15, 1895.
[2] N. Y. Polyclinic, Nov. 15, 1895, in an address before the Brit. Laryn. Assoc., July 26, 1895.
[3] At meeting of Brit. Laryn. Assoc., 1895; Buffalo Med. Jour., Dec., 1895.
[4] Lancet, Jan. 18, 1896.
[5] Jour. Am. Med. Assoc., Nov. 16, 1895.

Laryngeal Paralysis.—Lubinski[1] noted 5 cases of laryngeal paralysis in typhoid fever, 4 beginning after defervescence. It is generally due to paralysis of the vocal band, though ulceration, edema, and perichondritis may be found postmortem. Lubinski[2] noted in typhoid fever 2 cases of abductor paralysis, 3 cases involving one recurrent laryngeal, and 1 involving both. He also describes a case of posterior paralysis lasting 1 month and due to influenza.

Intubation.—Dr. J. O'Dwyer[3] recommends a simple incision through the cord, which destroys the valve, followed by the wearing of a cylindric intubation-tube until the incised cord has healed in the retracted position. He recommends hard-rubber instead of metallic tubes in this condition, as the rubber tube is not subject to calcareous deposit. He states that the excision of the vocal bands in this condition is unjustifiable.

Motor Aphasia.—Thomas and Roux[4] found that by showing patients the movements of articulation they quickly acquired the faculty of pronouncing syllables, and even words, so that in long-standing cases of motor asphasia they soon recover the power of language.

Hystero-traumatic Aphonia.—Bianchi and Massei[5] report a rare case of hysterical aphonia following the extirpation of a tumor from the larynx. After the aphonia had lasted 7 months the patient was hypnotized, and while in this condition the suggestion was made to her to speak in the future in a loud voice. This treatment was successful, and until the time the report was made, 5 months, the patient had continued to speak in a loud, distinct voice.

Stammering and Stuttering.—Winckler[6] traced heredity in 18 cases. This element is a weakness in power of coordination and a weak central nervous system. Local irritations, such as nasal defects, adenoids, papillomatous degeneration of mucous membrane of the turbinated bodies, purulent rhinitis, otitis media, and general physical condition due to scrofulosis, cryptorchism, phimosis, balanitis, and onanism, are etiologic factors. A high palate and trapezoid maxilla were found in 54 of 210 cases. Children who stammer excessively often have defective hearing.

Therapy.—Coen[7] describes the early studies of Colombat de l'Isere, Klancke, Lehwess, and Rosenthal, before Adolf Kussmaul in 1877 put the therapeutics on a scientific basis. Austrian and German methods both recognize the importance of normal respiration in normal speech. Coen fathered the older Austrian school; Gutzmann, the younger German school. After respiratory defects are remedied regulation of voice and articulation-coordination are in order: 1. Lung-gymnastics; 2. Regulation of coordination of the vocal and speech-apparatus; 3. Controlling disorders of innervation and removing causes of reflex irritation; 4. Developing the power of the controlling will; 5. General toning up of the system. Stimulating and sedative

[1] Ann. des Mal. de l'Oreille, 1895, xxi. p. 341; ref. Am. Med.-Surg. Bull., Jan. 11, 1896.
[2] Deutsch. med. Woch., No. 26, 1895; ref. Quart. Med. Jour., Oct., 1895.
[3] N. Y. Med. Jour., Dec. 28, 1895. [4] Quoted in Quart. Med. Jour., Apr., 1896.
[5] Quoted in Ann. of Ophth. and Otol., Apr., 1896. [6] Wien. med. Woch., Feb. 2, 1896.
[7] Ibid., July 27, 1895, and May 2, 1896.

treatment alternate. Hydrotherapy and electricity are used when indicated to develop respiratory power. The Berlin school relies upon continual gymnastics of the muscles of the speech-apparatus, so that the patient is conscious of certain movements. He is also trained to suppress involuntary movements. Coen holds that physical and moral endeavor is essential, and believes stammering is due to lessening of normal respiratory capacity dependent on intangible anatomic disturbances in the medulla oblongata and spinalis. Schroneck believes it due to disease of the cerebral cortex. Kussmaul calls it a neurosis due to congenital irritability of the syllable-coordinating apparatus.

Laryngeal Ictus.—Bedos[1] reports the cases of 41 men and 2 women, with an average age of 49. Sedentary habits, rheumatism, gout, and obesity predispose to it. "Old coughers" with chronic respiratory diseases are especially subject to it. The attack may occur at any time. The symptoms are —a tickling sensation in the larynx and sudden transient unconsciousness, with or without convulsive movements. The cough may be severe or light, the loss of consciousness complete or partial. The heart-action is weak for a moment. Convulsions are confined to upper limbs. Spasms are never tonic. The tabetic crisis is an epileptiform convulsion with true dyspnea, sometimes fatal. Tabetics may have crises simulating ictus, but other signs of tabes, pains, Romberg's sign, etc., will distinguish it. Charcot refers laryngeal ictus to reflex irritation of the superior laryngeal nerve; Gasquet, to circulatory disturbance in the semicircular canals and labyrinth; Cartaz ascribes it to hyperesthesia of the laryngeal mucous membrane causing inhibition through the pneumogastric nerve; Knight refers it to cerebral anemia.

Vibration of the Vocal Bands.—Hodgkinson[2] by insufflating finely powdered indigo on the bands and phonating, found the particles moved from the edge in curved lines corresponding to the amplitude of vibration of the bands. In normal bands the line extends from the anterior commissure to a point posterior to the vocal process with medium chest-tones; with lower tones the line extends farther posteriorly and is less curved. These results vary with quality of tone and with abnormal conditions of the bands. With falsetto tones the powder forms a line parallel to the free edge of the band, but is arrested halfway from the free edge to the ventricle, indicating that the whole length of the band vibrates with nearly equal amplitude, the outer half vibrating with less energy, a nodal line corresponding with the line of powder.

Teacher's Nodes.—Milligan[3] classifies the lesions found as follows: 1. Subacute and chronic laryngeal catarrh, affecting mainly the true vocal bands; 2. Chronic catarrhal laryngitis, with subsequent paresis of certain laryngeal muscles; 3. Chronic catarrhal laryngitis, with a varicose condition of the smaller vessels of the true band; 4. Chronic catarrhal laryngitis, with secondary pachydermic changes. He attributes the condition to the long hours of teaching, the raised pitch of voice necessitated, and the early age, 13 to 16, at which many teachers begin.

[1] Thèse de Paris, 1895; Gaz. heb. de Méd. et de Chir., Jan. 26, 1896.
[2] Brit. Med. Jour., Aug. 24, 1895. [3] Ibid., Nov. 2, 1895.

Diseases of the Trachea.—Griffin[1] described the case of a woman of 30, with condylomata extending 1 in. along the anterior wall of the trachea from a point near the vocal bands and passing $\frac{2}{3}$ around. The growth was irregular on the surface, and separated by fissures with abrupt and sharp edges, red in color, and covered with pultaceous secretions. Dram doses of potassium iodid 4 times a day, with an ointment of the red oxid of mercury rubbed into the region of the thyroid cartilage, in 3 weeks caused complete disappearance of the growth.

Fracture of Trachea.—Briegel[2] collected 33 cases with 22 deaths. Most of them were the result of external violence, though in 2 cases coughing is given as the cause, and 3 times excessive and sudden bending of the head backward or forward. The fracture could rarely be felt, on account of great emphysema. In some cases that survived cicatricial stenosis resulted. If dyspnea is severe, the trachea should be opened at once and artificial respiration practised if necessary.

Tracheotomy and Insufflation for Asphyxia.—Thiery[3] relates a case of asphyxia, due to edema of the glottis and chloroform-anesthesia, which recovered after tracheotomy, followed by direct insufflation for 10 minutes. The method should be used in all grave accidents from asphyxia, and should be persevered in, as 2 cases recovered after more than an hour's insufflations.

Medication of the Bronchus.—Muir[4] in 40 cases of phthisis, bronchiectasis, and bronchorrhea has injected remedies directly into the trachea by a $\frac{1}{2}$-oz. syringe with long laryngeal tip. Solutions of menthol from 7.5% to 15% in benzoinol were used, to which from .5% to 3% guaiacol was added in some cases. For offensive expectorations a 2% solution of europhen was used with benefit. Iodoform, benzosol, and salicylic acid cause nausea or are irritating. Injection is made after full inspiration, and causes a sensation of warmth in the chest. A solution of cocain to the larynx is advised before the first injection, which may be directed toward either bronchus. He recommends the method as a palliative in phthisis, not to replace constitutional medication.

[1] N. Y. Med. Jour., Nov. 16, 1895. [2] Quoted in Am. Med.-Surg. Bull., Oct. 15, 1895.
[3] Gaz. des Hôp., Oct. 1, 1895, quoted in Internat. Med. Mag., Feb., 1896.
[4] Am. Med.-Surg. Bull., Jan. 25, 1896.

DERMATOLOGY AND SYPHILIS.

By LOUIS A. DUHRING, M. D.,

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SUPERFICIAL ERYTHEMATA.

Multiform Erythemata.—Von Düring[1] divides the multiform erythemata into 3 groups: 1. Those in which the cutaneous manifestations are due to general infectious diseases, as in erythema exsudativum multiforme and erythema nodosum; 2. Angioneurosis, under which caption are comprised a number of urticarial and maculopapular efflorescences which bear resemblance to the cutaneous lesions of the infectious diseases, idiosyncrasy playing a part in the group; 3. Erythemata due to emboli, as exemplified in many of the so-called malignant multiform erythemata. The secondary metastases met in septic diseases also belong in this category.

The Visceral Complications of Erythema Exsudativum Multiforme.—Osler[2] defines erythema exsudativum as "a disease of unknown etiology with polymorphic skin-lesions—hyperemia, edema, and hemorrhage—arthritis occasionally, and a variable number of visceral manifestations, of which the most important are gastrointestinal crises, endocarditis, pericarditis, acute nephritis, and hemorrhage from the mucous surfaces." A noteworthy feature of the disease is the tendency to recurrences. Attention is also called to the observation that cutaneous symptoms may be absent, visceral disease alone being present; 11 cases are recorded in all of which gastrointestinal crises occurred—colic, usually with vomiting and diarrhea; 5 had acute nephritis. The lesions of the skin are polymorphic, ranging from simple purpura to extensive local edema, and from urticuria to large infiltrating hemorrhages into the skin and subcutaneous tissue. In all except 1 case there were several attacks, covering a period of from 2 months to 8 years. Hemorrhage was the most constant lesion. [The article is a valuable contribution to general pathology and to hemorrhagic disease in particular, especially purpura, of which the cases reported seem to be examples. Erythematous lesions were absent, and we therefore fail to comprehend why the cases recorded should be designated by the distinguished writer as erythema multiforme. It is a question of nomenclature and classification, and not of the observations made, that is open to criticism. The definition given of erythema multiforme seems too broad to be useful.]

Treatment of Erythema Intertrigo by Chromic Acid.—Brault[3]

[1] Arch. f. Dermat. u. Syph., Bd. xxxv. H. 2 u. 3. [2] Am. Jour. Med. Sci., Dec., 1895.
[3] Ann. de Dermat. et de Syph., No. 4, 1896.

finds that chromic acid, in the form of a 3% solution, not only produces a rapid cure, but also prevents, more effectually than any other remedy, relapses, the skin becoming somewhat hardened or tanned from its use. In cases in which there is much irritation it is advisable to employ at first some mild, moist antiseptic dressing The affected parts should be washed and dried, when the solution of chromic acid is to be brushed lightly over the skin. [It is well known that chromic acid in solution sometimes acts happily in hyperidrosis and bromidrosis in from 2 to 5% strength. A word of caution may be given: In intertrigo the solution should at first be weak, for sometimes it sets up an acute erythematous dermatitis instead of curing the disease.]

Recurrent Scarlatinoid Erythema.—Hartzell[1] reports a case, and justly remarks that, owing to the close resemblance of this cutaneous manifestation to a serious infectious disease, the question of diagnosis is of great importance. It may be distinguished from scarlatina by attention to the following points: 1. The redness is likely to be diffuse instead of punctate; 2. Instead of beginning upon the face, as in scarlatina, it usually commences upon some part of the trunk and spreads rapidly to other parts; 3. Desquamation begins much earlier than in scarlatina, usually on the second or third day of the attack; 4. Throat-symptoms are absent, or, if present, are usually very mild, and the so-called strawberry tongue is absent; 5. There are never any symptoms pointing to the kidneys, and the repeated recurrence of the eruption will make the diagnosis plain. The treatment should be on general principles. In the writer's case the internal administration of the fluid extract of jaborandi seemed to influence the disease favorably, mitigating at least the itching and burning.

Urticaria Treated with Calcium Chlorid.—Wright[2] considers the theories which seem to justify the administration of calcium chlorid in urticaria. In all conditions of diminished blood-coagulability there is not only a tendency to actual hemorrhage, but there is also a disposition to "serous hemorrhage," or an increased transudation of the fluids of the blood into the tissues. Persons whose blood-coagulability is diminished appear to be particularly liable to urticaria or to serous effusions into the skin. Instances are cited in which urticaria could be produced by diminishing the blood-coagulability by taking inordinate doses of calcium chlorid and by eating acid fruits, which diminish the blood-coagulability by abstracting lime salts from the blood. These facts show that an increased transudation may be due to a diminished blood-coagulability; hence hope may be entertained of correcting the defect of blood-coagulability. With this object in view calcium chlorid was employed in 2 cases, in doses of 30 gr. t. i. d. at first, and later in less amount (gr. 10), with the result of cure. In 1 case the blood-coagulation time was reduced in 2 days from 8 minutes to 2 minutes and 45 seconds. [One of the 2 cases reported was that of a man, aged 84, in which, although sulfonal was also used, the remedy seemed to have effected the cure. In the other case the urticaria was produced by an injection of antitoxin, and it is possible that

[1] Univ. Med. Mag., Aug., 1895.

[2] Brit. Jour. of Dermat., Mar., 1896.

the urticaria would have disappeared had the calcium chlorid not been used; but the interesting point in both cases is the count of the blood-coagulability-time after using the drug, and the rapidity—2 or 3 days—in which this occurred.]

ECZEMA AND PSORIASIS.

On an Outbreak of Perioral Eczema in the East End of London.—Savill[1] reports a large number of cases of an unknown epidemic disease of the skin, attacking chiefly the face and occurring in children. The affection has no relation with the epidemic dermatitis to which he directed attention in Nov., 1891, beyond its epidemicity and seasonal influence. In all, over 700 cases were observed, their investigation extending over a period of 18 months. In the study of the cases 3 important features were revealed: 1. The remarkable uniformity of the eruption in its appearance and locality; 2. The spread from person to person by contagion; 3. The disease was confined to children under 14 years of age. The chief clinical features were—1. The distribution around the mouth; 2. The uniformity of appearance as red, dry, scurfy patches; 3. The fairly uniform course and duration of each patch. Histologically, the disease was a catarrhal process of the epidermis. The very constant resemblance to the appearance of a dry eczema, and its equally constant distribution around the buccal and nasal orifices, induced the reporter to suggest the name "perioral eczema." The disease may be provisionally defined as a contagious malady, consisting of dry, red, scurfy, ovoid patches, each of which tends, after a few weeks, to spontaneous recovery; confined to the face and neck; rarely attacking children over 14; and occurring only during the summer months of the year. The reporter gives the differential diagnoses from eczema, seborrheic eczema, ringworm of the body, impetigo contagiosa, and the epidemic dermatitis which he described in 1891. The disease is regarded as infectious under certain conditions. Photographs accompany the paper. [The disease is peculiar, and cannot be considered as being an unusual form of any of the well-known diseases of the skin. The history and course point to an infection peculiar and due to some unknown causes connected with the institution or locality in which the epidemic occurred.]

Eczema due to Malaria Cured with Quinin.—Brocq[2] reports a case of circumscribed eczemaform eruption due to malarial poisoning occurring in a woman 40 years of age, apparently in good health, who had been under treatment for a rebellious eczema of the hand several years before. Upon the end of the nose, on the left side, was a small eruptive patch of irregular shape. The skin was red and slightly swollen; upon its surface were 7 or 8 papulo-vesicles, grayish-yellow and slightly moist. There was slight burning rather than itching, most marked in the morning upon awakening, and disappearing in the afternoon. It had lasted about a month and had spread but little. There was no other eruption elsewhere. Observation showed that the patch underwent regular variations: thus it enlarged some days before the menstrual

[1] Lancet, Jan. 4, 1896.

[2] Ann. de Dermat. et de Syph., No. 1, 1896.

period, becoming more swollen, red, and oozing. Every morning upon awakening the lesion was much inflamed, and an abundant, transparent, serous liquid oozed from the vesicles. Ordinarily it was very early in the morning when this congestive attack occurred, announced by a localized fever, with throbbing, tension, and burning. The attack reached its maximum between 7 and 9 o'clock in the morning, and then gradually diminished. By 6 o'clock in the evening the lesion was scarcely visible. Although the patient had never had an intermittent fever, she had had diverse manifestations of paludism which had yielded only to quinin in large doses. She was given quinin hydrochlorate, the local treatment being limited to a simple dressing. The effect of the quinin was remarkable: at the end of 48 hours the morning congestive attacks and oozing had ceased, and at the end of 4 days the lesion was no longer elevated and was undergoing resolution. The patient later ceased all treatment, when the eruption returned, but it again yielded to quinin. The writer concludes—1. That this disease of the skin should be placed among those dermatoses, still but little known, which constitute the pure and true cutaneous form of masked paludism; 2. That in the presence of a rebellious dermatosis, with unusual symptoms, one should think of the possibility of paludism; 3. That quinin and arsenic are in these cases really heroic remedies; 4. That the class of "paludides" proposed by Verneuil and Merklen ought to be accepted. [It is now generally conceded by dermatologists everywhere that malaria may be regarded as a recognized cause of various diseases of the skin, especially inflammatory and neurotic affections.]

Treatment of Eczema.—Bowen[1] considers at length the chief methods of treatment that have been introduced or advocated during later years. No specific has been discovered, and few new drugs have of late been added to the list of internal remedies. Arsenic is never used in the acute stage, being reserved for the chronic varieties, and even here it is employed much less than formerly. In the acute forms the inflamed surface should be protected from the outer air, the secretions absorbed and their formation limited, and remedies used to lessen the itching. Pastes are now used more often than ointments. They are composed of indifferent or astringent powders mixed with petrolatum in such proportions that a smooth, thick paste is formed. Chief among these is the paste introduced by Lassar, composed of equal parts of zinc oxid and starch in double the quantity of petrolatum. Salicylic acid is often added with advantage to this paste in the strength of 10 to 15 gr. to the ounce. The chief action of salicylic acid upon the skin is of a keratolytic character; that is, it has the property more than any other drug known of softening and dissolving the horny layer, without at the same time setting up inflammation. In the later stages of the disease, when there are considerable infiltration in the corium and hypertrophy of the horny layer, salicylic acid may be used with advantage in much greater proportion than in the formula just given. Salicylic ointments in the treatment of infantile eczema have been much extolled. Taking the paste mentioned as a base, various medicaments, such as sulphur,

[1] Boston M. and S. Jour., Oct. 10, 1895.

ichthyol, boric acid, and the like, may be advantageously incorporated with it. The writer speaks well of the salicylic soap-plaster recommended by Prof. Pick for the vesicular and moist as well as for the thickened forms of eczema. It is of special value in the latter forms, and is composed as follows: Liquefied soap-plaster, 2½ ounces; olive oil, 5 drams; salicylic acid, 22 gr. The plaster is spread, and then cut into strips which are firmly adapted to the affected parts and left in position for several days. Attention is called to ichthyol and resorcin. The efficacy of ichthyol is probably due in part to the large percentage of sulphur it contains. It may be used in solution with water in various proportions—as a thick varnish, mixed with albumin or starch, or in ointment form. On moist patches an emulsion with water of the strength of 1 : 10 or 1 : 20 parts is often of service, especially when followed by a soothing ointment or paste. Resorcin is of much value in certain cutaneous affections, but, according to the writer, it plays a small part in the treatment of eczema. "Ointment-muslins," made by impregnating muslin on one or both sides with the ointment desired, are useful in many cases. "Plaster-muslins" are also described, their usefulness being regarded far greater in tuberculosis and in chronic processes with hypertrophy of the horny layer than in eczema. Particular attention is called to the point that as yet there are no specifics for eczema, and that regulation of the diet, attention to hygiene, and removal of any conditions unfavorable to the general health are of very great importance. Internal remedies are frequently of great aid, especially in the so-called nervous forms of the disease, and success depends in this class of cases more upon the general management of the patient's life and upon moral influence and support than upon topical applications.

Protest against Over-treatment in Eczema.—Morris[1] believes that the notion is still somewhat widely prevalent that eczema is the offspring of a constitutional dyscrasia, or, in the language of the old pathology, the outward and visible sign of an inward peccant humor of some kind. This supposition (for he regards it as nothing else) leads to errors in treatment of the disease in two opposite directions: on the one hand, of doing too little; on the other, of doing too much, some believing that the skin-lesions act as issues whereby the supposed mischievous principle is withdrawn from the system, leaving them untreated in the fear that the healing of them might cause morbid determinations to the internal organs—a fear for which, according to the writer's experience, there is no foundation. Others direct all their therapeutic efforts toward forcing on what they call a "crisis." Their plan of campaign, apparently, is to drive the enemy into the open country, where he can in theory be crushed without difficulty. It is natural enough that at hydropathic institutions this method is most in favor, for there critical eruptions are among the usual incidents of the treatment, and therefore easily come to be looked upon as being an essential element in the cure. There is something seductive in the notion of bringing the disease to the surface and there dealing with it in a summary fashion, but, unfortunately, the plan does

[1] Brit. Med. Jour., Feb. 27, 1895.

not answer in practice. It is much easier to fan the flame of eczema than to subdue it. The writer has seen so many cases of eczema made worse by misdirected therapeutic measures that he thinks it is his duty, for the credit of the profession as well as in the interests of physicians, to utter a few words of warning on the subject. A case is cited in which a localized eczema had been aggravated by over-treatment until it was on the way to become general. The bread poultice used intensified the inflammatory process, and the bandages acted as vehicles for the conveyance of inoculable material to the parts to which they were bound. The dietetic restrictions helped to lower the patient's strength, without having any beneficial effect on the disease. The plan of treatment, in fact, was founded on an erroneous notion as to the nature of the disease. The use of strong remedies which cause irritation is more disastrous than the do-nothing policy of those who look upon eczema as a useful derivative. [The views of the writer are sound, and if followed by the general practitioner, who is often at a loss what to do next with his case in way of medication, injury to the patient may be avoided. As a rule, the remedies employed are too strong or are harsh, with the result that practically the eczema is aggravated instead of relieved, the aggravation often being attributed to an exacerbation of the process, when, in reality, it is the treatment that is making most of the mischief.]

Psoriasis Vulgaris in Infancy.—Riehl[1] records a case of psoriasis occurring in an infant 5½ weeks old, which, according to the mother's statement, first appeared on the 5th or 6th day after birth. The father of the child had been the subject of the same disease since he was 20 years of age. [Not many years ago it was stated by authors generally—especially those who followed the dictum of Professor Hebra—that this disease was not met with in those under 4 or 5 years of age, but the case just quoted, as well as others now found on record, shows that practically no age is exempt. As a rule, however, the disease spares infants and young children as well as the aged.]

Salicin and Salicylates in Psoriasis.—Crocker[2] believes that the use of these drugs is of much value in selected cases of this disease, especially in the variety "guttata" of extensive and recent development. They are useful, however, in all forms, except, perhaps, in old, chronic patches. Their employment must be temporarily discontinued if they give rise to gastro-intestinal disturbance or an aggravation of the disease of the skin.

Thyroid Extract in Psoriasis.—Thieberge[3] reports 11 cases treated in this way, and sums up his experience by stating that this drug is not a specific for psoriasis. It should be reserved for refractory cases in which the ordinary methods have failed. The effect should be watched very carefully. Brocq[4] states that the results obtained from this treatment in France have been most variable, and that he has seen it act favorably in only 1 instance, a very rebellious case. The injurious effects upon the economy of the drug and of

[1] Wien. med. Woch., No. 50, 1895.
[2] Lancet, June 8, 1895.
[3] Brit. Med. Jour., Aug. 31, 1896.
[4] Jour. Cut. and Gen.-urin. Dis., Aug., 1895.



Dr. J. F. Schamberg's case of impetigo contagiosa annulata et serpiginosa.

the fresh gland are dwelt upon, as shown by the experience of many dermatologists and in his own cases.

IMPETIGO, HERPES, PEMPHIGUS, DERMATITIS HERPETIFORMIS.

Impetigo Contagiosa Annulata et Serpiginosa.—Schamberg[1] gives the case of a boy, aged 10, in which, in addition to pea-sized crusted pustules about the face, neck, arms, and back, there were in the axillæ and on the pubes large serpiginous annular pustular patches the size of a hand, with centers almost free of eruption (see Plate 15). The crusts were yellowish-brown, greasy, loosely attached, and bulky, projecting $\frac{1}{8}$ in. above the level of the skin. Large fragments of crust hung here and there from the borders, as if attached only by a thread. The skin was not reddened, except where the crusts had been removed. Microscopic examination of the crusts failed to reveal any elements of a fungous growth, but micrococci were found in the pus, mostly in groups of twos. The pus from an unruptured vesicopustule gave a similar result. The disease had existed 8 weeks, but was cured under a mercurial ointment. [The abstractor of the article had the opportunity of seeing this case, and is therefore in a position to corroborate the diagnosis and to verify the description. This disease, as the present case illustrates, is not always so acute in its course as is generally stated in books, nor is it by any means confined to the hands and face. On one occasion the abstractor met with a case, likewise in a boy aged 10, in which the lesions—typical vesicopustules and pustules—existed solely on the buttocks and posterior aspect of the thighs. They were pea-sized, for the most part discrete, and very numerous. The annular arrangement and serpiginous course of the lesions, as well as the long duration of the disease, in Dr. Schamberg's case are unusual and interesting.]

Herpes Zoster relieved by Camphor employed Internally.—Drinkwater[2] records a case of herpes zoster of unusual distribution, occupying the auricular, lower maxillary, and cervical regions. The pain was very severe. Opiates had been used without relief. Acting on the statement made by Edward Woakes in one of his works, that tobacco has a paralytic action on the superior cervical ganglion, and that the vasomotor paresis extended to the vessels supplied to the branches of the four upper cervical nerves, the dilated blood-vessels exerting pressure on the nerve-fibers, and thus causing pain and some trophic change resulting in vesicle-formation, and that if such were the case camphor internally should afford some relief, 5-minim doses of spirit of camphor on sugar were given 3 times a day. There was a remarkable improvement almost immediately. The first night she slept well, and the next day she was quite free from pain, and it never recurred at all; but what struck the reporter as most remarkable of all was that the group of vesicles that had come out last were all retrogressive, and those over the parotid had disappeared, leaving no sign of their former presence—that is, they had not gone through

[1] Jour. Cut. and Gen.-urin. Dis., May, 1896.

[2] Brit. Med. Jour., Apr. 13, 1895.

the usual course of crust-formation; the contents had been reabsorbed. The reporter feels inclined to attribute the amelioration of the disease to the effect of the camphor, and would recommend its trial in other cases.

Nerve-lesions in Herpes Zoster.—Ebstein[1] reports a case of herpes zoster with facial paralysis, and another with sensory disturbances, and gives some interesting results of an investigation of the disease. Concerning the pathology, he agrees with the view of Recklinghausen, that there is a primary affection of vasomotor nerves, the vasodilators being irritated, and looks on the herpes as an intense angioneurotic disturbance which may be associated with diseases of the motor or sensory, spinal, or cerebral nerves. The rare appearance of herpes in cases of motor disturbances, and the cause of the paralytic phenomena in motor nerves and of symptoms of irritation in sensory and vasomotor nerves he thinks cannot now be explained. In most cases the disease results from causes acting on the body in general, though trauma and cold may assist. Infection or autointoxication may also possibly play a part. [In some cases there is every reason to believe that the disease is due to an infection, but the nature of this infection is often obscure or unknown.]

The Protozoa-like Bodies of Herpes Zoster.—Hartzell[2] calls attention to and describes certain peculiar organisms found in the vesicles of herpes zoster, being the same which Pfeiffer regards as protozoa and the cause of the disease. The author found these bodies not only in the ordinary forms of zoster, but also in a case of traumatic zoster in which there had been many recurrences for a period of years. He does not regard them as protozoa, but as being forms of cell-degeneration.

The So-called Protozoa of Herpes Zoster.—Gilchrist[3] has investigated the histopathology of so-called idiopathic herpes zoster in 20 cases. The sections were taken from lesions in different stages of the disease with a view to determining the nature of the so-called protozoa described by Pfeiffer, Wasiliewski, Hartzell, and others. These peculiar bodies were found in sections taken from a portion of skin which exhibited the erythematous stage preceding the formation of the vesicle. These sections show that the earliest changes consist of a serous exudation into the epidermis, with separation of the epithelial cells and the formation of the curious bodies under discussion. They appear singly or in groups, and are most numerous at the bottom and sides of the vesicle. Sometimes they are found among the epithelial cells of the hair-follicle, some of the largest groups being found here without the least evidence of any vesicular formation. While more numerous in the newly-formed vesicles, they are not entirely confined to them. They vary very much in character, but usually appear in the form of well-defined bodies with a thick outline which encloses granular contents, with the central portion more deeply stained. They are grouped in different ways—sometimes lying in an apparently coherent mass, and showing evidences of considerable pressure; some-

[1] Virch. Arch., Bd. cxxxiv. H. 3. [2] Jour. Cut. and Gen.-urin. Dis., Sept., 1894.
[3] Johns Hopkins Hosp. Rep., vol. i.

times the individual bodies are separated one from another, and the groups surrounded by a protoplasm; at other times the latter is absent. The masses consist of an odd as often as an even number of the bodies. Perhaps the most satisfactory idea of the origin and nature of these bodies can be formed by the study of them in the prevesicular stage of the disease and when they occur in epithelium situated at some distance from the vesicle. The bodies resemble normal nuclei in every respect, being similar to them in size, shape, staining properties, and in the possession of a limiting membrane and of a nucleolus. A careful comparison between these bodies and undoubted protozoa shows that the former can hardly be mistaken for protozoan organisms. There was no evidence of any ameboid movements in any of them. The results of the observation lead to the conclusion that these so-called protozoa are really nuclei of epithelial cells, but, even if this be granted, it has not as yet been clearly explained how these groups of nuclei arise. A number of other kinds of bodies were seen which presented some similarity to the so-called cancer-parasites. These were chiefly found in the hair-follicles and amongst the innermost layer of cells. It would seem almost certain that these bodies are only large eleidin-granules corresponding to the eleidin-granule of the stratum granulosum. They are perfectly homogeneous, well defined, stain deeply, particularly with fuchsin, and their appearance under the microscope is very like some of the bodies which are regarded by some observers as "cancer-parasites."

Acute Pemphigus.—Pernet and Bulloch[1] record 17 cases of acute pemphigus, and from their observations state that there exists a group of rare cases, accompanied by severe systemic symptoms, which affect butchers and generally end fatally. The disease follows a wound of the hand, and is probably due to a microorganism. The same etiological factors probably produce another group of very similar cases in which the subjects come in contact with animals or dead portions of animals.

Whipham[2] records 2 cases of acute pemphigus that were under observation at St. George's Hospital. Both were of unusual severity; one recovered, the other died. Both were treated by increasing doses of arsenic, and in both the remarkable effects of the drug in this particular disease were strikingly illustrated. The contribution to the literature of pemphigus is also a valuable one in many respects. The account of the bacteriologic examination of the cases is complete, and adds considerably to our knowledge. The following points were established bacteriologically: 1. A diplococcus answering in every respect to that found by Demmé, Claessen, and Bulloch was demonstrated in the contents of the bullæ of the child during life: 2. This diplococcus was grown from the contents of the bullæ, and was obtained as a pure culture outside of the body; 3. After the death of the child a similar organism was found in the lungs and minute hemorrhages were found in the alveoli; 4. Pure cultures of diplococcus, after having been grown for many generations outside of the body, when introduced into the system of either guinea-pigs or mice by hypodermic injection or "vaccination" caused death; 5. After death diplococci were grown

[1] Brit. Jour. of Dermat., May and June, 1896.

[2] Lancet, May 2, 1896.

as pure cultures from the blood of these animals, and these cultures killed other animals; 6. Appearances found in the lungs of these animals were comparable to those found in the child's lungs; 7. Diplococci were found in sections of the lungs of the animals. The following conclusions may be drawn: Since bullæ have not been produced in the animals, it cannot be said that the diplococci found were the cause of the disease; but, as this organism was found by 4 independent observers in cases of acute pemphigus, we think, in the light of the result obtained by the reporter, that there is a strong presumption in favor of this being the case. The treatment by arsenic was adopted in both cases, and the improvement in either case followed immediately upon its administration. A change for the better occurred in the case of the woman within 48 hours of her taking the first dose of arsenic. In the case of the child the formation of the bullæ was very greatly checked in about the same time. [The great value of arsenic in true pemphigus is not as fully appreciated as it deserves. Much credit is due Mr. Hutchinson for the many observations he has published during the past 30 years illustrative of the favorable influence of this drug in most cases of the disease. True pemphigus is much rarer in this country than it is in Europe, not many instances being recorded in the United States.]

A New Suppurative and Pemphigoid Eruption of Cutaneous Tuberculosis.—Hallopeau[1] reports a case of this very rare form of disease, the substance of which may be formulated as follows: 1. Pustular tuberculosis in young subjects may be the point of departure of deep infiltrations into the derma, which extend themselves rapidly on the surface in such a manner as soon to form indurated patches several centimeters in diameter, rounded or ovoidal, often confluent, ulcerated or only partially so, having a tendency to heal rapidly; 2. The epidermis about the periphery of the patches may be the seat of a pemphigoid formation; 3. The characters of this neoplasm are to be distinguished from all other forms of cutaneous tuberculosis heretofore described; they may coincide with the tuberculous infiltrations in agminated nodules and with the elements of lichen scrofulosorum, and may be centered around the hair-follicles.

Pathologic Anatomy of Duhring's Disease (Dermatitis Herpetiformis).—Leredde and Perrin[2] describe in the variety known as "herpes gestationis" and in the commoner form of the disease the following histological changes: The lesions of the derma are often limited to the papillary bodies, or at least are most abundant there. Diapedesis is sometimes very intense. The migratory elements consist essentially of lymphocytes and eosinophilous cells. Cells of a different kind, polynuclear elements, are observed when the blebs and vesicles have matured, but more abundantly when they have suppurated. This occurrence is probably due to ordinary microbic infection. Edema is the second essential element of the alterations of the derma; it is at times excessive, and is the result of a vasomotor paralysis of the vessels of the derma. The existence of migratory eosinophilous cells between the

[1] Jour. des Mal. cut. et syph., Fév., 1896. [2] Ann. de Dermat. et de Syph., 1895, p. 451.

cells of the mucous layer is altogether peculiar, marks the importance of these elements in the disease, and shows the tendency of the skin to eliminate them in all possible ways. The diffuse elimination of these elements by the epidermis is only accessory, the vesicles and blebs being the essential means of excretion. The writers believe that the erythema, vesicles, and blebs, grouped in diverse ways, are the morbid elements which reveal to the clinician a general malady, the cutaneous effects of a sanguineous alteration. This alteration, constant in the cases which they have studied, determines the elimination by the skin of eosinophilous cells in excess in the blood. The identity of herpes gestationis and dermatitis herpetiformis (long ago insisted upon by Duhring) is found both in the presence of cells having a special microchemic reaction, coming from the blood-vessels of the derma and eliminated by the epidermis, and by the alteration of the blood, in which one finds a certain number of eosinophilous cells.

The Dermatosis of Duhring occurring in Pregnancy.—Perrin,[1] who has made a study of this disease (also known as "herpes gestationis"), arrives at the following conclusions: 1. Herpes gestationis is a variety of Duhring's disease. Pregnancy predisposes to it because of the troubles it causes in the functions of the kidneys. 2. Duhring's disease seems to be connected with the presence in the blood, afterward in the skin, of a substance which is fixed by the white globules under the form of acidophilous granules. 3. The toxicity of the liquid in the vesicles appears to be due to this substance. It is this which produces the nervous effects of the disease, and perhaps the death of the fetus in pregnant women who are affected by it.

Dermatitis Herpetiformis in Concentric Circles.—Hallopeau[2] describes a rare variety of this disease, different forms manifesting themselves in the course of its evolution. At first it was composed either of vesicles or groups of vesicles situated upon an erythematous base; or of papules, the central portion of which soon became the seat of a bleb or of blebs, which dried up, the desiccated epidermis of which soon assumed a dark-red tinge. Soon the erythema spread eccentrically, and a circle of vesicles, isolated or confluent, was seen at its periphery. The eruption continued to spread; a series of new rings, alternately erythematous and vesicular, varying in number from 1 to 6, formed in succession. On a certain number of the papules vesication forms, not in the center, but at the periphery, in the form of a collarette. If two patches coalesced, the parts which formed the two circles (*i. e.* where they met) were partially obliterated. The color of the erythema was bright, dark, or pale red according to the duration of the lesion. The contents of the vesicles were serous at first, sometimes becoming seropurulent. In various situations over the trunk the patches tended to run together, and thus to form large

[1] "Dermatose de Duhring au Cours de la Grossesse," Ann. de Dermat. et de Syph., 1895, p. 936.

[2] Pictorial Atlas of Skin Diseases and Syphilitic Affections, in photolithochromes from models in the Museum of the St. Louis Hospital, Paris, London, and Philadelphia, Part 3, 1896.

erythematous tracts surrounded by a regularly polycyclic, circinate, bullous, raised margin. In the differential diagnosis the analogy and resemblance to herpes iris is pointed out by the writer, but he and his colleagues concluded that the diagnosis of dermatitis herpetiformis was more accurate. Subsequently a purpuric eruption supervened, superadded to which symptoms indicating the occurrence of an acute nephritis set in. At the same time, the general health seriously deteriorated, and the patient died within a month. Hallopeau thinks that the mode of progression in concentric circles of this erythematovesicular eruption can scarcely be explained otherwise than by the centrifugal development of some infectious agent, probably of a toxin; for the tendency to attribute Duhring's disease to the intervention of these products, he states, is becoming more and more marked. In all probability the fatal nephritis must be referred to the same cause.

Pathology of Dermatitis Herpetiformis (Duhring).—Gilchrist[1] examined an excised portion of skin from a typical vesicular and erythematous patch taken from the back of a man aged 22. The vesicles were minute and the patch was of a dull-red color. The sections showed the various changes from the beginning of the process up to the point of vesiculation. The epidermis remained passive, except that in the mucous layer there were a number of vacuolated cells with shrunken nuclei and a few polynuclear leukocytes. The granular layer was still discernible, and nuclear figures were not more numerous than normal. The most striking changes were found in the upper part of the corium, particularly in the papillæ. The dilated blood-vessels contained, besides red blood-corpuscles, numerous polynuclear leukocytes, and in the larger vessels a few eosinophilous cells. The next stage showed the papillæ and tissue around the vessels infiltrated with large numbers of polynuclear leukocytes, small mononuclear cells and eosinophilous cells, together with fibrin. In the more advanced processes the papillæ were filled with dense masses of polynuclear leukocytes which pushed up the epidermis, beneath which there was a clear space which contained fine strands of fibrin and granules of coagulated albumin. These dense collections of cells in neighboring papillæ became confluent in places, and with increasing serous exudation formed larger and larger vesicles, which were thus situated between the epidermis and corium. These vesicles were filled with a very close fine and coarse network of fibrin, which contained in its meshes numerous polynuclear leukocytes, some of which were disintegrated, a very few detached epithelial cells, a few mononuclear cells, a large number of eosinophilous cells, and lastly a finely granular substance (coagulated albumin). The whole upper half of the corium was also invaded by the same inflammatory material, but the mononuclear cells and the eosinophilous cells were principally aggregated around the vessels. The deeper portion of the corium did not show any change. The pathology of dermatitis herpetiformis is thus seen to be characterized in its earlier stage by a very acute inflammation of the papillary layer of the corium, with the formation of vesicles directly beneath the epidermis, the wandering out of enormous numbers

[1] Johns Hopkins Hosp. Rep., vol. i.

of polynuclear leukocytes, and also numerous eosinophiles, the epidermis being only passively engaged.

DERMATITIS.

Dermatitis Exfoliativa Neonatorum.—Morton[1] describes a case similar to those described by von Rittershain. The mother of the infant was a healthy Irish woman, and the child weighed 8 lb. at birth; 4 weeks later an erythematous eruption on the skin appeared, first on the face, and 2 days afterward the entire body was bright red. In about a week the epidermis began to crack and to scale off, and continued to desquamate for 3 weeks. When the entire horny layer had desquamated the surface of the skin remained smooth and red for a few days, and then desquamated again, this process recurring 3 times. The palms, soles, and nails were never involved. The child was well nourished and was not notably restless. The child recovered. [This disease is rare, and has not often been met in this country. In 1868, von Rittershain of Prag first encountered it, and in 1878 reported a number of cases that had been encountered in the foundling asylum during the previous 10 years, nearly half of the entire number having terminated fatally. The infants were generally attacked in the second week of life. The etiology of the disease has always been regarded as obscure, but von Rittershain thought that septic infection through the buccal mucous membrane was possible.

Another case of the same disease is recorded by White.[2] It began 10 days after birth, and seems to have been caused by an escape of hard-coal gas in the room, the mother and child both suffering considerable constitutional disturbance. The epidermis peeled off in flakes the size of a large postage-stamp. The pulse and temperature were but little affected, and the general condition remained fairly good. Recovery under simple local remedies occurred in 14 days.

Histologic Examination of the Action of Phenol on Healthy Skin.—Frickenhaus[3] concludes, as the result of many experiments made upon human beings and rabbits, that liquefied phenol as a caustic does not act very deeply, and that it is characterized by prompt scarring, especially upon hairy regions. Upon human skin it acts only upon the epidermis, but upon rabbits a portion of the cutis is affected. This effect on human skin is produced usually by one application, and surely by three, one being made each day. A necrobic eschar results, which in structure is well preserved, resembling that of dry gangrene and mummification. The necrosis is deeper in the central portion than around the periphery of the cauterization. A nonpigmented or a not deeply pigmented scar remains, which in the course of 3 months disappears entirely.

The indications in practice for the use of phenol as a caustic are plain. It should not be employed for processes which run their course in the cutis unless the horny layer of the epidermis is first destroyed by caustic potassa or am-

[1] N. Y. Med. Jour., June 8, 1895. [2] Jour. Cut. and Gen.-urin. Dis., Aug., 1895.
[3] Monatsh. f. prakt. Dermat., Bd. xxii. No. 7.

monia. On account of liability to general intoxication larger areas than from a half to a whole dollar in size should not be acted upon at one sitting. The healing should not be left to nature when a cosmetic result is desired, as on the face a certain degree of healing by second intention gives better results.

Contribution to the Pathology of Freezing.—Hodara[1] examined 5 cases of skin from 2 patients whose extremities had been frostbitten. Since the date of Recklinghausen's discovery of hyaline vessel-thrombi in gangrenous frostbite of the extremities, interest in the pathology of this disease has been awakened and his observation confirmed, especially by Kriege. Hodara believes, with Kriege and Samuel, that inflammation necessarily precedes freezing, and agrees with Unna that the regressive changes are the most important of all in the process, and sums up his investigations as follows: Freezing consists in a marked inflammatory reaction, with varied alterations of the blood and with the formation of several kinds of thrombi in most of the vessels; these thrombi are hyaline, leucocytic, fibrinous, erythrocytic, and fibrous. It is very likely that these thrombi constitute the chief cause of mortification, the homogenization of the connective tissue, and the formation of superficial and deep-seated eschars. In severe cases the eschars may extend to a considerable death; in milder cases they are cast off completely and are replaced by scars. [A series of colored microscopic drawings shows the chief points in the pathologic anatomy of the disease, made plain by the newer methods of staining as employed by Unna.]

Hydroa Æstivale.—Graham[2] gives notes of 2 cases of this rare affection. The first was a girl aged 6, who 2 years before first showed some small red spots on the face and hands. They grew larger, became vesicular and then pustular, attained their full size in 2 or 3 days, when a dark spot appeared in the center of each, after which a crust formed over the whole surface. These dried up and fell off in a few days. The whole duration of each crop of vesicles was about 10 days. During the summer appeared successive crops of this eruption, which in many instances left permanent scars. In every instance the attack followed exposure to either the direct or the reflected rays of the sun. In the autumn of the first year the eruption disappeared altogether, but in the latter part of the following winter, after driving on a bright day when snow was on the ground, her face was again affected, especially on parts not protected by a hood. While wearing gloves the hands were not affected, but became so when she left them off. With the appearance of the eruption there was slight burning, but it was not itchy at any time. It always appeared when she went out if the sun was shining, and sometimes after sitting at an open window if a warm wind was blowing, although the sun's rays did not shine directly on her. No effect was produced by going out on a dark, cloudy day. Nearly every form of application seemed to aggravate the disease. During the next winter, when she remained constantly in the house, small spots appeared occasionally, but they did not become vesicular and

[1] Monatsh. f. prakt. Dermat., Bd. xxii. No. 9.

[2] Jour. Cut. and Gen.-urin. Dis., Feb., 1896.

PLATE 16.



Dr. Herbert Stowers' case of dermatitis repens (Brit. Jour. Dermat., Jan., 1896).

soon faded away. The eruption occupied the face, ears, and right hand, and consisted of lesions about the size of a dime. Some were umbilicated and resembled small-pox pustules; others were covered with crusts, while very superficial scars were found in places where crusts had previously existed. The lips were much swollen and were covered with large pustules, which were elongated. There was general swelling of the face. The patient was lost sight of for 15 years, when it was learned that the condition of the skin remained the same until her thirteenth year, when menstruation commenced. From that time until the eighteenth year the eruption gradually disappeared, and at the latter age it ceased entirely, her general health being remarkably good. The second case was a woman aged 25, a blonde, the peculiar disease of the skin having manifested itself at the age of 11, and it had steadily continued since that time. The phenomena during the last 14 years have changed very little. When she was exposed to the sun's rays for about 20 minutes she noticed a burning sensation upon the unprotected parts of the body, soon followed by extreme swelling and small water-blisters. These in 2 or 3 days became yellow, and on the surface thin scales would form which would speedily dry up and fall off, leaving a reddened surface which would soon return to the normal condition. The pustules were never umbilicated. They appeared in crops, and varied in duration according to the severity of the attack, sometimes 8 or 10 days, in other cases 2 or 3 weeks. Sometimes the eyes were almost closed, and attacks were accompanied by general malaise, coryza, sleeplessness, and anorexia. The eruption occurred on any part of the body exposed to the sun, even if the latter was not shining directly on the skin. She is afraid to go out of the house even on a cloudy day, and has been kept almost a prisoner in the house during the daytime for the last 14 years.

It is evident from the description of these cases, as well as from those given by Unna, that the eruption is not always of a "vacciniform" character, and that therefore the term "hydroa vacciniforme" does not apply to all cases. The term "hydroa puerorum," adopted by Unna, is also inappropriate, as one instance occurred in a girl. The direct rays of the sun are not the only cause of the disease, as it may arise from the heated atmosphere of a room when the sun is shining. The heat from a stove, however, had no effect in either case. One of the reporter's cases knew by experience exactly how near she could sit to an open window with safety, and, moreover, there was much greater danger when the window was open than when it was closed. There was no evidence in either case that cold winds in winter would produce the eruption. [These cases have been quoted at length because the disease is rare and not well understood. The clinical features vary considerably in different cases, as the writer has demonstrated, and the diagnosis made from the lesions alone may not be easy. It is only within the past few years that it has been fully described.]

Dermatitis Repens.—Stowers[1] reports a striking case of this rare disease (see Plate 16). The patient was a woman 67 years of age, in average general health. When 30 years of age, 2 weeks after the birth of her second child, a

[1] Brit. Jour. of Dermat., Jan., 1896.

small "gathering" was noticed in the matrix of the right thumb-nail, which was incised, the nail shortly afterward being cast off. The wound never healed, but continued inflamed, and small pustules formed around it at various times. A year later the left thumb became affected in a like manner. At intervals varying from 8 to 16 months the nails of other fingers became involved, the third and fourth fingers of the left hand alone escaping. The nails of the toes were likewise affected, all being lost except the nail of the third toe of the left foot. The inflammation slowly spread to other parts of the hands and feet, which became covered with dry scales; the second and third phalanges of the fingers, the palms of the hands, the toes and soles of the feet became raw and shiny, and entirely denuded of epithelium. Tingling, itching, and burning accompanied the disease, which were severe enough to interfere with the patient's sleep. This condition of the fingers and toes persisted until the patient's death, at the age of 74, from a gastric disease, probably carcinoma. [The drawing in color presented shows a peculiar and very rare form of dermatitis, somewhat resembling eczema, and also certain rare forms of erythematous dermatitis neuropathica, usually occurring in one or more extremities, and which are sometimes reflex, attacking first one and then the other extremity, as occurred in a case of "dermatitis vesiculosa neuropathica" reported by the abstractor in the International Medical Magazine, March, 1892.]

A New Pernicious Skin-disease.—Spiegler[1] reports the case of a man aged 38 years, with a negative family history, who 18 years before had had syphilis, for which he was treated, without subsequent symptoms. The present disease began 18 days before in the form of a red spot and nodule on the breast. The rest of the body became covered with erythematous and nodular efflorescences, and soon blebs formed, some being hemorrhagic. The entire trunk and extremities showed the disease of the skin. The lesions varied in size from a pinhead to that of a hazelnut. Some simulated macular herpes tonsurans. The nodules were red and hard, and became pale on pressure. As the older macular lesions disappeared, they became covered with crusts which on removal caused slight bleeding. In other areas there were flat, dry, dark scales suggesting necrosis. The tongue was covered with a thick white coating, and on the upper surface were countless oval spots devoid of epithelium. The patient became much prostrated, and died 36 days after the onset of the disease. The blebs showed the presence of microorganisms, which were found invariably in the bleb-contents in pure culture 4 days before death, but later they were replaced by the staphylococcus pyogenes aureus, the fluid taken on the last day showing the latter microorganism only. Nothing was found in the blood except a mild degree of leukocytosis. The urine showed only a trace of albumin. A section of the skin in the region of the bleb showed the papillary vessels dilated, with small, round cell-infiltration in the neighboring layers and in the meshwork of the cutis. Fresh extravasations of blood were found in the papillæ. The cells of the mucous layer were separated from one another, the prickle-cells being extremely distinct. Kaposi suggested the name

[1] Arch. f. Dermat. u. Syph., Bd. xxxiii. p. 69.

"erythema papulo-vesico-bullosum et necroticans," both he and the reporter regarding the case as unique from every standpoint.

SPECIFIC INFLAMMATIONS.

Erysipelas in its Etiologic Relation to a Preceding Skin-lesion and its Local Treatment.—Allen [1] states that in 100 cases of erysipelas 50 were found to be due to a preexisting skin-lesion, often, it need not be stated, slight. The treatment advocated is the combination of the compressive and protective, in the form of application of bands of rubber adhesive plaster and covering the enclosed parts with ichthyol in collodion, in strength varying from 10 to 50%. The results were satisfactory.

Diphtheria of the Skin.—Müller [2] records the case of a child whose whole left side was scalded with boiling water. Under treatment, on the 7th day the wounds were covered with new epidermis. The mother now kissed the child's neck at the border of the granulating wound, and on the following day was seized with pain in the throat, and later diphtheric inflammation of the tonsils appeared. She and the aunt of the child, who was also attacked by the same disease, were isolated, and the child's father fell ill the next day, and had a slight sore throat, which was probably diphtheric. The two women recovered under injections of Behring's antitoxin; 7 days from the date of the scald the spot where the child had been kissed was the seat of a white swollen spot 4 cm. in diameter, bordered by intensely red streaks and surrounded by an edematous area which soon spread to the right eye. Under 2 injections of antitoxin the diphtheria of the skin healed, no throat-symptoms appearing.

The So-called Parasites of Varicella.—Gilchrist [3] examined microscopically a number of the more recently formed vesicles excised from 2 cases of varicella. Numerous multinuclear cells were encountered similar to those met with in the vesicles of herpes zoster. They were found near the base and along the sides of the vesicles. Many varieties of these cells were found containing from 2 to 10 bodies (nuclei), which were apparently enclosed in a capsule, although there was some resemblance between these multinucleated cells of varicella and certain of the sporulation forms of Gilchrist's protozoa, yet the similarity extended only to these particular forms, and a comparison between these bodies and the protozoa and the blastomycetes before mentioned [elsewhere described in this book] shows conclusively that they have nothing in common with the parasites. The vesicle of varicella, speaking generally, is very similar to that of herpes zoster, except that the latter shows evidences of a more acute process. It is probable that the bodies which have been called parasites in varicella, like those of herpes zoster, are simply the results of degenerative changes in the epithelial cells.

Unusual Appearance of a Circinate Ringworm.—Cantrell [4] gives the case of a girl, aged 10, in which the lesions were situated upon the right

[1] Med. Rec., Nov. 15, 1895, p. 723.
[2] Berl. klin. Woch., Oct. 28, 1895.
[3] Johns Hopkins Hosp. Rep., vol. i.
[4] Med. News, Sept. 21, 1895.

forearm, below the elbow on the flexor surface, in the form of two rings. The outer or larger ring of the eruption was round and ¾ in. in diameter, with a number of vesicles around its border. Within this ring occurred 5 smaller, likewise ringed, vesicular lesions, which, although separated one from another, were close together (see Fig. 162). The older annular lesion was of 2 weeks' duration; the smaller ones within the ring were 2 days old. Mycelium was abundant, but spores were almost entirely absent. The same observer [1] has recently noted a similar case in which the tinea circinata was made up of two distinct rings concentrically arranged. [Such manifestations in tinea trichophytina circinata, while well known and have been depicted in literature, are nevertheless rare, and are liable to be confounded with herpes iris, a variety of erythema multiforme.]

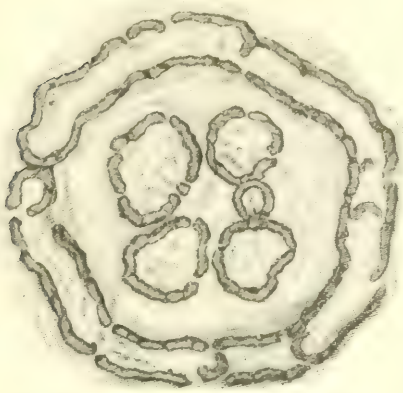


FIG. 162.—Circinate ringworm (Med. News, Sept. 21, 1895).

Treatment of Trichophytosis (Ringworm) based on the Physiology of the Trichophyton.—Roberts' [2] conclusions, arrived at after careful study of the subject with experimentation, are—1. There exists in the vegetable world a class of minute flowerless plants (fungi) capable of digesting and assimilating hair and other keratogenous tissues; 2. The process might be called "trichophytosis," of which there are divers varieties; 3. This process might take place on the skin of the living host or in the hair that had had no connection with a living organism; 4. It follows that trichophytosis follicularis is a combination of a saprogenic destruction of an inert body which leads to pathologic cell-processes; 5. Once the fungus has entered into the interior of the follicle, any further direct control over it is lost; 6. Therapeutic influence over the fungus lies in the power of exciting proliferation of the soft cells of the follicles; 7. In any case it is desirable to carry the excitement beyond physiologic bounds, so as to produce pus; 8. Epithelial pus-formation is not followed by any loss of tissue, but connective-tissue pus leads invariably to ulceration; 9. If possible, therefore, suppuration should be limited to the epithelium.

Common Salt for the Treatment of Ringworm.—Reilly [3] having noticed the fact that children suffering from ringworm of the scalp speedily improved if sent to the seashore, treated 3 successive cases by the application of common salt to the scalp, and describes the result in each case as remarkable, a cure being effected in less than 4 weeks. A strong solution of sodium chlorid was applied to the scalp for 5 successive nights, and washed off in the morning with a solution of boric acid.

[1] Jour. Cut. and Gen.-urin. Dis., Aug., 1895. [2] Brit. Med. Jour., Dec. 21, 1895.
[3] Ibid., Nov. 23, 1895.

Balsam of Peru in Scabies.—Jullien and Descouleurs[1] believe that balsam of Peru is more speedily fatal to the sarcoptes scabiei than sulphur. Being volatile, it readily penetrates the burrows of the mite without the amount of friction that sulphur requires. In chronic cases it may be applied for a considerable period without giving rise to irritation of the skin, and hence is of special value in cases where pustules are abundant; in eczematous subjects; in cases in which baths might be injurious; in subjects with albuminuria; and in feeble persons. A thin coating of the drug may be lightly brushed over the skin, and afterward gently rubbed into it. It is a simple remedy; is effective and sure in its action; is always indicated, and possesses the advantage of having an agreeable odor. [The drug has long been favorably known for its power and favorable action in scabies, and is much used, especially for infants and children, in many clinics, but, as it is usually combined with sulphur, the communication of the authors is specially valuable.]

BRIGHT'S DISEASE; DIABETES.

Affections of the Skin occurring in the Course of Bright's Disease.—Pye-Smith[2] first calls attention to the only cutaneous disorder hitherto generally recognized as occurring in Bright's disease—namely, the erythema læve of Willan, the original description of which was published in 1808. He noted its uniformly smooth and shiny surface, the red patches becoming confluent, and its association with anasarca. There are, however, according to Pye-Smith, other forms of dermatitis which not infrequently occur in the course of chronic Bright's disease: 1. There is a bright-red diffused rash which appears chiefly on the trunk, less extensively on the neck, arms, and thighs, and very seldom on the face, hands, or feet. It is distinguished from the somewhat similar rash produced by natural or artificial diaphoresis by its locality, by the absence of sudamina, and by its appearing when no hot-air baths or other means have been used to produce sweating, and when the skin is harsh and dry. It does not, as a rule, either itch or smart, and only lasts a few days. It occurs oftenest in cases of chronic tubal nephritis. 2. There is a papular eruption with large, discrete, rather dark-red lesions seated on a dry, rough, and sometimes scaly surface. It occurs most often on the outer side of the thighs and legs, the shoulders, hands, and extensor surface of the forearm, but it may also affect the loins and the abdomen. It is not met with on the face or on the hands and feet. 3. Apart from the mere coincidence of eczema with Bright's disease, there is observed in some cases a moist dermatitis resembling eczema, but occupying the arms or the legs without affecting the flexures of the joints, the face, or the ears, without the irritation commonly present, and without having previously existed. 4. On two occasions the writer has seen a very extensive and profuse dermatitis closely resembling the universal exfoliative dermatitis of Wilson, very red, very scaly, occupying the scalp, palms, soles, and genitals, as well as the trunk, face, and limbs. It has come on after the symptoms of Bright's disease have appeared in cases of

[1] Ann. de Dermat. et de Syph., No. 4, 1896. [2] Brit. Med. Jour., Nov. 13, 1895.

chronic interstitial nephritis, with little dropsy, and cardio-vascular changes already apparent.

Different as these forms of dermatitis are in their anatomy, they have certain common characters apart from their occurring in patients suffering from Bright's disease. They are superficial and leave no trace behind when they disappear or after death. They run an acute or subacute, not a chronic, course, and seldom recur after they have disappeared. They are never pustular. They are occasionally purpuric, but this is rare, offering a contrast with the hemorrhagic erythema of rheumatism and erythema nodosum. The subjective symptoms are usually slight. With respect to prognosis, they usually occur in the later stages of the renal disease, and therefore may be not infrequently present at the time of death. But they often disappear long before this, and their appearance does not coincide with any special aggravation of the other symptoms. As to their pathology, the writer is not inclined to connect them with uremia except by a natural coincidence, for the latter condition is frequently noted in its most characteristic and fatal form without any cutaneous eruption. Lead carbonate, zinc oxid, calamine, or bismuth lotions have appeared to be the most useful applications, and sometimes inunction with olive oil or vaselin has been more efficient than any more active treatment. None of the affections described, except erythema læve, are common.

Uremic Bullous Dermatitis.—Barrs[1] relates a marked case of this cutaneous manifestation occurring in a woman aged 19, the subject of chronic Bright's disease. The bullæ first appeared about the vulva, and afterward invaded almost the entire surface. Uremic symptoms became more and more pronounced, and the patient died.

The Cutaneous Manifestations of Diabetes.—Morrow[2] observes that the phenomena of diabetes are essentially those of disordered nutrition. The skin is specially susceptible to impaired nutrition from this cause, under which it is particularly prone to inflammation, suppuration, and gangrene. Almost every form and degree of inflammation, from a simple erythema to the highest grade of dermatitis, may occur in the course of diabetes. The subject may be divided into two classes, the first containing affections with certain special characters which reveal their diabetic origin and nature, some being functional, others structural, such as pruritus, erythema, eczema, balanoposthitis, phimosis, furuncle, carbuncle, gangrene, and xanthema diabeticorum. In the second class may be placed affections which occur incidentally and with comparative infrequency, their tendency to recovery or retrogression according to the fluctuation in the amount of sugar present plainly indicating some etiologic connection. Among the most important may be mentioned acne cacheticorum, chronic papular urticaria, impetiginous and lichenoid eruptions, psoriasis, dermatitis herpetiformis, herpes zoster, ulcus perforans, erysipelas, and dermatitis diabetica papillomatosa. The diabetic dermatoses are important from a diagnostic standpoint. The most characteristic of the cutaneous disorders are found in the genital region, arising from contact with the saccharine

[1] Brit. Jour. of Dermat., Jan., 1896.

[2] Med. Rec., Apr. 11, 1896.

urine. The urine undergoing rapid fermentation favors cryptogamic vegetation, which appears as white deposits on the surface or between the epithelial cells. They are formed of rounded or oval cells and a mycelium made up of long and short branches, sometimes articulated. In addition to the saccharomyces are possible forms of spores; among the micrococci, the staphylococcus aureus and bacilli of the group of the bacillus coli are present. Among the most frequent manifestations are furuncles, eczema, gangrene, and xanthoma. It has been estimated that furuncles occur in from one-tenth to one-fourth of all cases of diabetes. The cutaneous tissues in diabetes are particularly prone to take on gangrene, the process occurring spontaneously or secondarily to wounds and contusions, particularly on the lower extremities.

Xanthoma diabeticorum is a peculiar disease. Out of the 21 cases reported, glycosuria was traced as the etiologic factor in all but 3. The eruption consists of small pea-sized tumors of a rounded or conical form, discrete or confluent, some of them surrouunded by a yellowish summit which causes them to resemble pustules. The affection is differentiated from common xanthoma by the rapidity of its development, the character of the papules, which are firm, hard, and inflammatory, and their seats of predilection, sparing the eyelids; by its invariable presence in the form of circumscribed papules, never occurring in striæ or plaques; by its subjective sensations; by the facility of its retrogression, which may be spontaneous or the result of the removal of the glycosuria. Morrow brings forward references to various other diseases of the skin in which it has been shown that diabetes may be the cause in some cases. [The article is an important contribution to the possible etiology of certain diseases of the skin, and illustrates in a striking manner the numerous and varied manifestations upon the skin that may be produced by a single poisonous substance in the circulation.]

NOTES ON DERMATITIS MEDICAMENTOSA (DRUG ERUPTIONS).

Fordyce[1] reports several rare cases, the first being the **nodular form of iodic eruption.** The patient was a woman, aged 37, suffering from syphilitic hemiplegia. While taking 60 gr. of potassium iodid, t. i. d., two painful indurated nodules appeared in the subcutaneous tissue of the paralyzed thigh. Under the continued use of the iodid they increased rapidly in size, until they became larger than a man's fist, extending deeply into the subcutaneous tissue, involving a surface area of 5 in. in diameter. The swellings became softer and simulated deep-seated abscesses. The drug was discontinued, and in a week they completely disappeared.

Two cases of **rupia-like eruptions due to potassium iodid** are recorded, which could scarcely be distinguished from the syphilodermata which were present at the same time. The use of all antisyphilitic treatment was discontinued, and the sores were treated by boric-acid ointment, under which they healed rapidly, leaving brownish-red pigmented scars, which could not be

[1] Jour. Cut. and Gen.-urin. Dis., Dec., 1895.

distinguished from the scars left by the former syphiloderm. After a period of several weeks the iodid alone was given, and with a similar result.

An instance of **erythema scarlatinoides following the application of mercurial ointment to the pubic region** is reported, in which the diagnosis of scarlatina had been made by a physician. The diagnosis was made by noting that the pubic region was stained by mercurial inunction, which the patient admitted having used a few days before for pediculi. Within a week there followed abundant desquamation from the entire body, especially profuse on the hands and feet. At no time was there an elevation of temperature nor was the throat implicated. [Similar eruptions are occasionally observed from the internal administration of mercury, the protiodid, calomel, from the hypodermic use of calomel, from mercuric-chlorid dressings, and from exposure to mercurial fumigation, cases of which have been reported by Fournier, Engleman, Lesser, and others.]

An example of **erythematous eruption from the internal use of boric acid** may also be noted, the patient, a woman, having taken doses of 30 gr. daily for a month for cystitis. At the end of this period a polymorphous erythema appeared over the trunk, and at the same time a marked painful swelling of the upper eyelids. The eruption spread over the upper extremities, and the eyelids became indurated and hard. The boric acid was now discontinued, and cold compresses were applied to the lids. Within a week the edema of the lids and the erythema disappeared. [While erythematous, vesicular, and bullous manifestations have been recorded as arising from the internal and local employment of boric acid, the occurrence of solid edema of the eyelids, as in the case under consideration, is very rare.]

Eruption from Quinin resembling Erysipelas.—Stebbings[1] records a case of a woman 22 years of age who, for an acute catarrh in the head, took 8 gr. of quinin the afternoon preceding the advent of the eruption. The first symptom was an extreme puffiness about the face, principally on the right side and involving the right eyelid. The swelling extended down over the neck and across chest and breasts, showing also over limbs and arms; at some points about and along the margin of the infiltration there were intolerable itching and burning. This superficial dermatitis kept pace in its movement with the subcutaneous edema. There was a doughy feel, showing considerable infiltration under a moderate pressure—some pitting, and heaviness in muscular action of the face. [The case is of interest because of the close resemblance of the disease produced by quinin to common erysipelas, such forms of dermatitis from this drug being somewhat unusual.]

Mercurial eruptions are considered in their varied forms by Rosenthal,[2] who notes that inunction occasions them more frequently than mercury administered by the mouth. Under the use of the insoluble mercurial salts these eruptions, salivation, and stomatitis have decreased somewhat in frequency. When an eruption occurs other signs of mercurial intoxication seldom coexist. In cases in which the eruption is pronounced such general symptoms as fever,

[1] N. Am. Pract., Feb., 1896.

[2] Berl. klin. Woch., Nos. 23, 24, 1895.

headache, and depression may occur. Erythema, the several varieties of eczema, exfoliative dermatitis, pemphigus, folliculitis, and purpura, all may occur, pemphigus being the most serious manifestation, as illustrated by a case. Mercurial erythema may resemble the eruption of scarlatina or measles. All of the manifestations tend to take on a polymorphic character.

Bullous Eruption following the Administration of Arsenic.—Caigor[1] records the notes of the case of a delicate and anemic lady, aged 48, in whom vesicles and blebs, arising from a reddened and an edematous skin, formed upon the hands (palms and backs of fingers) 4 days after beginning the use of an arsenical mixture taken for sacral pain and debility. The blebs, some of them $\frac{3}{4}$ in. in diameter, never became purulent. In the course of 3 weeks the skin of the hands exfoliated, and at the end of a month recovery was nearly complete. The diagnosis of cheiropompholyx was made, the definite and symmetrical distribution of the lesions militating against the view that it was due to the arsenic that had been taken; 8 months later arsenic was again prescribed, and an eruption similar in all respects to the previous outbreak occurred, this being the third attack of the kind from which the patient had suffered. [There seems no reason to question the observation that the eruption was due to arsenic, and, furthermore, that it was an example of pompholyx, as the writer of the article suggests, but does not support. Pompholyx is a well-known, distinctly neurotic disease, and may be caused by arsenic precisely in the same manner as herpes zoster is often caused by this drug. We should designate the case, therefore, as one of cheiropompholyx produced by the ingestion of arsenic.]

A cutaneous outbreak presumably due to the ingestion of potassium acetate is reported by Cantrell.[2] The patient was a man aged 68, who had been taking the drug in 20-gr. doses, oft repeated, for some time. The eruption occupied the arms and forearms, and consisted of a number of aggregated lesions, resembling somewhat papular and papulovesicular herpes zoster, flat rather than acuminate, including the inflammatory areola. After discontinuing the drug the skin gradually regained its former healthy state, but not without having first manifested an erythematous and edematous condition in patches which suggested a superficial hemorrhage into the skin. The drug was subsequently given in the same dosage on two separate occasions, in both of which the same cutaneous manifestations appeared as in the first attack. [Eruptions of any kind following the administration of potassium acetate are rare. The eruption bore more resemblance to small patches of abortive herpes zoster than to any other recognized dermatosis; the lesions nevertheless differed from that disease. It is to be noted that the subject had taken the drug for a considerable period before any symptoms appeared on the skin.]

A rare form of skin-disease following the external use of iodin-liniment is reported by Dobie,[3] which occurred in a man of 24 who was suffering from pneumonia and advanced renal disease. The back of the trunk

[1] Brit. Med. Jour., Apr. 18, 1896. [2] N. Y. Med. Jour., Mar. 21, 1896.

[3] Lancet, Sept. 28, 1895.

was painted with diluted iodin-liniment morning and evening for 4 days. On the fifth day the patient's face was completely covered with a papular, pustular, and vesicular, and, in some localities, a bullous, eruption. The pustules were discrete and confluent, forming large encrusted sores, with swelling of the eyelids, lips, nose, and ears. There was, moreover, a copious discharge from the nostrils. The face was increased enormously in size. At the same time a perfectly different, purely papular eruption made its appearance upon the backs of the hands, wrists, and forearms. The eruption on the face gradually died away without scabbing. The papules on the hand continued prominent. Two weeks from the beginning of the cutaneous outbreak the patient died of uremic convulsions. The resemblance of the eruption to variola was noted by the reporter and his colleagues in the hospital, it being impossible to distinguish the difference without minute examination and inspection of the fluid on puncture of the papule and study of the history of the case. [This form of iodid-eruption has been described and depicted in the Atlas of Skin-diseases published 20 odd years ago by the New Sydenham Society, and is also referred to by Crocker in his Treatise on Skin-diseases. The case is peculiar and different from other similar cases in the fact that the eruption was produced by the local application of tincture of iodin on a region distant from the seat of the cutaneous disease. The abstractor has recently observed a somewhat similar case, although the dermatitis did not proceed beyond an erythema. Tincture of iodin was painted over the lumbar region, and in 24 hours an erythematous patch larger than an outspread hand manifested itself in the groin and down the inner surface of one thigh. The fluid had not run over and on to the thigh, nor had the groin or thigh been touched or handled by the patient.]

Sulfonal Exanthemata.—Walters[1] notes the previously reported cases, generally of erythema resembling scarlet fever, and reports 2 personal observations. He remarks that the eruption is mostly located in the follicles, and thence through confluence the efflorescence spreads, becoming large, reddened areas, with, in addition, vesicles. On the whole, the resemblance is to scarlet fever, which may in rare cases also show vesicles.

ACTINOMYCOSIS; MYCETOMA.

The Symptoms of Cutaneous Actinomycosis.—Monestié[2] states that actinomycosis affecting the skin may be secondary to extensive visceral invasion or may be local, as in connection with the inferior maxilla. The affection is most common on the face, and next on the hands. It manifests itself in two forms—the gummatous and the anthracoid, the former presenting cavities resembling the gummata of syphilis or of tuberculosis, containing pus, each opening by small fistulæ. The anthracoid form presents numerous fistulæ, which discharge a small amount of pus which does not collect at any one point. A pathognomonic sign, noted by Derville, is the presence of maculæ more or

[1] Therap. Monatsh., 1895, H. 12.

[2] Jour. des Sci. méd. de Lille, and Brit. Jour. of Dermat., Mar., 1896.



Drs. Hyde and Senn's case of mycetoma (Jour. of Cutan. and Gen.-Urin. Dis., Jan., 1896).

less pronounced according to the color of the surrounding skin. If the general color is pale, they are violaceous; if dark, they are black or bluish-gray. The spots vary from a pinhead to a bean in size, and possess a central whitish point, but pus may be obtained usually only in small quantity. Palpation and microscopic examination of the pus are both aids to diagnosis. Droplets of seropurulent matter may be squeezed out of fistulæ by gentle pressure on the tumor; or, if fistulæ do not exist, the softer portions of the tumor may be punctured and the yellow or bloody fluid thus obtained.

Therapeutics of Actinomycosis.—Rydygier[1] reports 2 cases treated successfully with local parenchymatous injections of potassium iodid, solutions of 1% being used. At first 1 syringeful was injected, but subsequently this dose was increased from 1 to 7 syringefuls at intervals of 3 to 7 days, and extending over a period of 6 weeks. In 1 case, after 1½ syringefuls had been injected into the infiltration on the side of the neck, a small abscess formed, which after incision decreased in size. After 2 or 3 more injections within a month the swelling gradually disappeared. In 1 case infection occurred through a tooth that had been injured by biting an apple which had been packed in barley-husks, a tumor on the neck below the jaw appearing a few weeks afterward. In the other case the disease, characterized by a large tumor on the abdomen, had probably been contracted from a horse that showed a swelling in the belly.

Mycetoma of the Foot as it Occurs in America.—Hyde and Senn[2] describe a case of this disease which they believe to be the first undoubted case of "Madura foot" occurring in the United States (see Plate 17). The case occurred in a man aged 20, born in Iowa of Bohemian parentage. The disease first appeared at the age of 7 years, when he was in the habit of walking barefoot in Cedar River. A nodule formed on the sole of the left foot soon afterward, which gradually grew, the disease ultimately involving the foot to such an extent that amputation had to be performed, although not much pain accompanied the disease. The clinical features, together with the microscopic examination, rendered the diagnosis positive, the case answering to the descriptions given by observers in India, especially Carter, Kanthack, and Vincent. The diagnosis of the reporters was confirmed, moreover, by Adami of Montreal. Hyde and Senn incline to the view that the fungus is not the same as that of actinomycosis, although closely related to it. They are disposed to regard Kemper's case of "podelcoma," published in the American Practitioner for 1876, as being a different form of disease.

Further Observations upon Madura Foot-disease in America.—Adami and Kirkpatrick[3] of Montreal further describe a case which was presented before the Association of American Physicians in 1895. The disease occurred in a French-Canadian 21 years of age, and was 10 years in developing. The authors distinguish clearly between mycetoma and actinomycosis, and they look upon Kemper's case of "podelcoma" as a doubtful

[1] Wien. klin. Woch., Sept. 12, 1895. [2] Jour. Cut. and Gen.-urin. Dis., Jan., 1896.
[3] Mont. Med. Jour., Jan., 1896.

one of true mycetoma, because of the acute and rapid course of the disease, 6 months only elapsing from the beginning until amputation had to be performed; the presence of great pain; the existence of vesicles and blebs; and the absence of the typical buttons of granulation-tissue. [The report of this case brings to light other cases of what were probably instances of this disease, as observed by Shepherd of Montreal, and by Pope, who operated on a Mexican, the specimen being in the Army Medical Museum at Washington. The case of Adami and Kirkpatrick is probably the first authentic one to be reported with care on this continent, that of Hyde and Senn having been reported somewhat later.]

The Skin-lesions of Syringomyelia.—Galloway[1] concludes that the weight of clinical evidence tends to corroborate the experimental results obtained by Mott, Sherrington, Ferrier, and Turner—namely, that sensory impulses in all their modes are conducted by gray matter, and not by the anterolateral or posterior ascending fibers, as once asserted. The possible conduction of educated touch in opposition to ordinary contact sensation by the white matter of the posterior columns is admitted. Further, in the numerous lesions of the skin that play so important a part in Morvan's type of the disease he feels inclined to consider that local infective processes play by far the predominant part in their production. He is also of the opinion that it is needless to seek for recondite cases for the production of the pustular and vesicular eruptions when there are plenty of common staphylococci and streptococci at hand to do the work. The writer also believes in the possibility of an ascending toxic neuritis from the affected part or due to the absorption of bacterial poisons. The scarcity of herpetic eruptions is evidence that the irregular pustulobullous eruptions met with were of local rather than of central origin.

Symmetrical Acrosphacelus without Raynaud's Phenomena.—Hutchinson[2] remarks that all who have studied in any detail the cases grouped together under the name of Raynaud's malady will admit that the time has arrived when they should be classified. They are not all alike, nor do they all tend to the same results. It would be well, indeed, he adds, if we could cease to use the term "Raynaud's disease" and speak rather of "Raynaud's phenomena." The phenomena in question are those of acroteric asphyxia, and are liable to variation at different times, being in many cases distinctly paroxysmal, and are to be explained by reference to the influence of the nervous system upon the blood-vessels. Many of the cases which have been quoted as examples of Raynaud's disease are, however, complicated, or even primarily induced, by organic disease of other parts. Although, unfortunately, Raynaud designated the affection which he described as "symmetrical gangrene of the extremities," it is now certain that many cases in which the phenomena which he describes as present are not attended by gangrene, and that some very definite forms of symmetrical gangrene are neither preceded nor followed by the paroxysmal phenomena referred to.

Two unusual cases are cited by Hutchinson—one in which there occurred

[1] Brit. Med. Jour., Dec., 21, 1895.

[2] Arch. of Surg., July, 1896.

PLATE 18.



Mr. Jonathan Hutchinson's cases of symmetrical gangrene of digits without Raynaud's phenomena (Arch. of Surg., July, 1896).

a sudden illness attended by severe pain in the chest and symmetrical gangrene of all the digits, the nose, and the ears, terminating in complete recovery of health. In the other case symmetrical acrosphacelus occurred as a single attack in an adult man previously in good health, and followed, after separation of the sloughs, by complete recovery. Without giving the full notes of these cases, it may be said that they appear to agree in the following points: In both the patient was a robust man who had never had any serious illness before. In neither was there any former history of rheumatism, gout, or syphilis. In neither had there been any peculiarity of the circulation observed previously. In both the stumps healed soundly and the restoration of the circulation appeared to be complete. No occlusion of the distal arteries was ever proved in either case. No heart-disease was shown. In both the onset of the attack was sudden, the hands, toes, ears, and nose being involved. Both patients had a serious illness at the time the gangrene commenced; in one diphtheria was diagnosed, in the other rheumatic fever. In both it is probable that a very definite condition of asphyxia or venous turgescence was present in the early stage and persisted until the gangrene was complete. Against the belief that there was any mechanical occlusion of the affected vessels we have the fact that the sphacelus was symmetrical, and that it affected the nose and ears as well as the digits. The nervous system may have had its share of the process, but it was not primarily at fault. [Pictures illustrating these interesting and instructive cases are reproduced (see Plate 18).]

HEMORRHAGES.

Relation of Peliosis to the Other Forms of Idiopathic Purpura.—Diehl,[1] after calling attention to the fact that there exists a difference of opinion as to the relation peliosis rheumatica holds to purpura simplex and purpura hæmorrhagica, brings forward a case which he believes proves the theory that purpura simplex, purpura hæmorrhagica, and peliosis are one and same affection, each presenting the same local manifestations and differing only in their individual severity. The disease in this case began as a simplex purpura and continued as such for a long time, and was about disappearing when a sudden change of atmospheric conditions produced an exacerbation with distinct rheumatic symptoms.

The Relationship of Purpura Rheumatica to Erythema Exsudativum Multiforme.—Mackenzie[2] discusses the subject from the standpoint of general medicine, and, after alluding to the recent articles of Osler, Wright, and Fayrer, gives his own experience with purpura rheumatica, citing personal cases. He believes that whilst purpura and erythema multiforme own many causes, in a large proportion of cases they suggest blood-alteration, and urticaria is nosologically closely allied to them. In this connection Wright's observations,[3] pointing out that in urticaria diminished coagulability of the blood is probably a factor, are of value. Mackenzie thinks that the term

[1] Buffalo M. and S. Jour., Jan., 1896. [2] Brit. Jour. of Dermat., Apr., 1896.
[3] Lancet, Jan. 18, 1896.

purpura rheumatica or purpuric rheumatism should be restricted, to show its intimate relation with rheumatism, which justifies regarding it, along with arthritis, endocarditis, chorea, and erythema nodosum, as in itself an expression of rheumatism. In many cases it is purely hemorrhagic from first to last. While it presents many features in common with exudative erythema, it nevertheless presents such definite characters and pursues such an uniform course that it is advisable to recognize it as a distinct clinical type.

A Remarkable Case of Purpuric Eruption ending in Gangrene, apparently Caused by Sodium Salicylate.—Shepherd[1] of Montreal records a case occurring in a strong man of 32, who was admitted to the hospital for supposed acute rheumatism. After three 20-gr. doses of sodium salicylate an eruption appeared on the body and extremities looking very much like urticaria, but without much itching. Successive crops appearing, the drug was discontinued. The spots became petechial, raised, and considerably indurated. In some places a slough resulted from the excessive hemorrhage, which on separating left well-marked ulcers which were very slow to heal. Myalgic and arthralgic pains accompanied the eruption. The period occupied by the disease was 33 days. All the superficial parts of the body, except the palms and soles, were affected. The mouth, soft palate, tongue, pharynx, and larynx were all seats of the eruption, and there was much edematous swelling of the mucous membrane. [Eruptions following the internal administration of sodium salicylate are not rare, but they are usually erythematous, edematous, or urticarial and itchy, rather than hemorrhagic. The case reported bears resemblance to purpura rheumatica or peliosis rheumatica in its symptomatology, but there is no reason to doubt that the disease was either produced or influenced by the drug.]

Case of Purpura Hæmorrhagica (Acute Exudative Erythema).—Fayrer[2] reports a case in which there occurred extensive and pronounced hemorrhagic patches in the skin, the patient being a strong, well-developed man aged 24, in the army, who never before had been ill, but he had the aspect of being anemic. The skin was abnormally pale and the lips and conjunctiva were generally pallid. The disease began suddenly with acute articular rheumatoid symptoms, especially swelling, and with sore mouth and gums, and later with puffing of the face. A week later spontaneous large purpuric patches occurred about his face, and within a few days on the thighs. Within the following week edema of the glottis and of the tongue and mouth, and later ulceration, occurred. New purpuric lesions continued to appear, and at the end of about 3 months from the beginning of the illness he had recovered.

The reporter thinks there is little ground for regarding the articular and other swellings as being due to rheumatism. The temperature did not indicate an attack of severe rheumatism, and the swelling was peculiar, the edema being great, and was followed by slight staining, which preceded the hemorrhagic patches which ultimately appeared. There was no cardiac disease. The pathology of this disease is obscure, and the case is recorded as a clinical con-

[1] Jour. Cut. and Gen.-urin. Dis., Jan., 1896. [2] Brit. Jour. of Dermat., Aar., 1896.

tribution to the relationship of purpura rheumatica, purpura hæmorrhagica, erythema nodosum, and erythema multiforme. [The title of the article is "Purpura Hæmorrhagica (Acute Erythema Multiforme)," but the notes of the case show no cutaneous lesions that could possibly be regarded as erythematous. They were purpuric, and only purpuric, from the beginning to the end; hence the term "erythema multiforme" as applied to this and to other like cases is a misnomer. That the etiology and pathology of erythema multiforme and purpura hæmorrhagica are in many cases closely allied there can be no doubt, but this is no reason why the terms should be used synonymously or together, as in the case reported.]

NEUROSES.

Pathology of Itching, and its Treatment by Large Doses of Calcium Chlorid.—Savill[1] expresses the view that itching is either primary or secondary, no eruption being present in the former variety—the latter, however, being accompanied by or succeeded by some form of eruption, as, for example, eczema. The secondary form may be explained by involvement of the terminal nerve-fibers in the lesions of the skin. The explanation of primary itching is probably to be found in some blood-change, in proof of which statement it may be noted that it is usually generalized in distribution, and varies in intensity from time to time, often from hour to hour or day to day. Certain articles of food cause it or aggravate it. In certain forms of itching, as that met with in diabetes, gout, jaundice, changes in the blood are known to occur, and morphin introduced into the blood gives rise to itching. Upon these grounds the author administered large doses of calcium chlorid in both primary and secondary itching, and with success. Large doses often succeeded when smaller ones failed, and in the large number of cases in which it was employed there were no absolute failures. The dose was never less than 20 gr. t. i. d., largely diluted with water, after meals.

Two Cases of Pruritus cured by Antipyrin.—F. Arnstein and Atoniak[2] report 2 chronic cases in which this drug acted happily. The first case occurred in a woman 28 years of age, the disease beginning upon the vulva, from which region it progressively extended over the thighs, abdomen, back, neck, chest, and upper extremities. There were no alterations in the texture of the skin. In the course of the fourth month of the disease antipyrin was taken twice daily, and at the end of 10 days the pruritus had completely disappeared. The second case occurred in a woman aged 66 years, the subject of senile pruritus. Under moderate doses 4 times daily the disease entirely disappeared in 2 weeks. [There is no doubt that not only this particular drug, but others belonging to the same group, are of value in pruritus, and also in other diseases, as dermatitis herpetiformis, in which the terminal nerve-filaments are involved. Antipyrin was recommended for pruritus 5 years ago, in 1891, by Blaschko of Berlin, under the name of phenazone.]

[1] Lancet, Aug. 1, 1896.

[2] Jour. des Mal. cut. et syph., Fév., 1896.

HYPERTROPHIES.

Case of Ichthyosis Congenita with some Unusual Features.—Cabot[1] reports an example of this disease which occurred in the practice of Dr. Roth of Newark, who states that when the baby was born the outer canthi of the eyelids were drawn downward and inward, almost completely closing the eyeballs from view. There was no vernix caseosa on the child's head or body, the skin being perfectly dry at birth. The nose was like a white, bony prominence protruding from the face. The angles of the mouth were tightly drawn downward and inward and had a cracked appearance. The ears were bound down to the head and were immovable, and looked as though they were gangrenous. There was no hair on the child's head; both nares were closed, so that an incision into each one had to be made to permit the child to breathe; the rest of the body—that is, the skin—had an appearance as though the child was enveloped in oil-silk, was shrivelled, and not glistening, but dull. The child was born at 7 months of utero gestation. The mother was 4 days in labor. The child was weak and marasmic at birth, but at the end of 2 months had gradually gained in weight, and became fairly healthy except for the skin-disease and occasional attacks of bronchitis. Subsequently, however, at the age of 16 months, the child died as a result of general malnutrition, marked hyperpyrexic symptoms being particularly notable. The case is interesting in that the child lived much longer than is usual in congenital ichthyosis of this type, it being very exceptional in this form of the disease for children to live more than a few days. [Comparatively few cases of this form of keratosis are on record. It is to be distinguished from the different and common forms of ichthyosis met with in infancy, childhood, and adult life, which appears either as I. simplex or hystrix.]

Ichthyosis with Hypertrophy simulating Scleroderma.—Hallopeau and Jeanselme[2] call attention to the observation that several writers have described defective development or atrophy of the skin (as in the cases reported by Audry in Jour. des Mal. cut. et syph., 1895). A case is reported at length, the authors concluding their observations—1. Ichthyosis may be accompanied by a defect in the development of the skin simulating scleroderma; 2. It may result in functional disturbances, such as the impossibility of closing completely the eyelids; 3. The movements of the fingers may be equally involved; 4. The derma is in such cases thinned in places, and its elasticity is lessened; 5. These cutaneous alterations coexist with a defect of development, very pronounced, of the underlying parts, and in particular of the skeleton of the extremities, as of the auricular cartilages; 6. The proximate cause of these alterations is in all probability an arrest of development of the skeleton and of the skin, leading on to their hypertrophy.

The So-called Parasites of Molluscum Contagiosum.—Gilchrist[3] says that among the chief supporters of the parasitic view of this disease may

[1] Med. Rec., July 6, 1895. [2] Jour. des Mal. cut. et syph., Fév., 1896.

[3] Johns Hopkins Hosp. Rep., vol. i.



Mr. Jonathan Hutchinson's case of xeroplasia herpetiformis (Brit. Med. Journ. June 1, 1889).

be mentioned Neisser, Mansuroff, Ziegler, L. Pfeiffer, and Rieder. Unna in his last work (Histopathology of the Diseases of the Skin) gives a thorough view of the whole subject, and mentions the names of Retzius and Klebs, Bollinger, Darier, Vidal, and Leloir as being still in favor of the parasitic theory. At the present time, however, the majority of dermatologists are of the opinion that molluscum contagiosum is not a parasitic disease, and that the "molluscum bodies" are the result of degenerative processes occurring in the epithelial cells of the epidermis. With respect to the contagiousness of the disease authorities are still divided. The supporters of the parasite theory claim to notice a great resemblance between the molluscum bodies and coccidia, but as far as Gilchrist's observations have gone it is difficult to see upon the presence of what common characteristic features their conclusions are based. Comparing these bodies with undoubted protozoa, Gilchrist has found no developmental forms of the "molluscum bodies," whereas developmental forms of undoubted protozoa were very numerous. In the neighborhood of "molluscum bodies" no inflammatory changes were produced, whereas the protozoa always set up an acute inflammatory affection, as well as producing chronic changes. "Molluscum bodies" are only found in the epidermis, and are absent from the corium, whereas the protozoa attack not only the epidermis and corium, but are found in large numbers also in the subcutaneous tissue, as well as in the neighboring lymphatic glands. Inoculation-experiments with molluscum contagiosum, although occasionally successful, have very often shown negative results, whereas inoculations of the protozoa of one of Gilchrist's cases into animals were successfully carried out. The "molluscum bodies" are perfectly homogeneous, and have been traced by many competent observers as originating from gradual degenerative changes in the prickle-cells of the epidermis. The different stages of development of the protozoa are not degenerative; they have also been carefully followed, and show no resemblance to those taking place in the molluscum bodies. Broadly speaking, when compared together under the microscope there is little or no resemblance between the protozoa observed by Gilchrist and the molluscum bodies. His observations have made him take sides with those investigators who deny that the "molluscum bodies" have any claim to be considered protozoa, and who hold that they are probably derived from degenerative epithelial cells.

Nature of the Cells in Molluscum Contagiosum.—Kuznitzky[1] believes that we may consider the following points as established: 1. The disease is contagious; 2. It is the product of epithelial hypertrophy and has no relation with the sebaceous glands; 3. The epithelial proliferation begins, as a rule, in the upper layers of the mucous layer, and not in the apertures of the follicles or in the roots of the hair. The question whether the epithelial changes are of a degenerative nature or represent organized parasites is not yet decided. To determine, if possible, the last point the author examined microscopically sections of molluscum tumors prepared by the alcohol-celloidin method and stained with Unna's polychrome methylene-blue or hematoxylin.

[1] Arch. f. Dermat. u. Syph., Bd. xxx. 1, 2.

He believes, first, that the so-called molluscum bodies are in genetic relation with the normal prickle-cells; secondly, that the changed cells are not coccidia. [In the same journal, Bd. xxx. H. 3 Touton, who believes in the coccidial theory of these peculiar bodies, replies to Kuznitzky's article, stating that until Kuznitzky defines more accurately what he means by "homogeneous" degeneration he must still hold to the parasitic nature of these bodies. He is of opinion that the changes of the nuclei described by Kuznitzky are contractions produced artificially.]

Pathology of Pigment-anomalies of the Skin.—Orlandi[1] reports cases, and observes concerning the pathogenesis of pigmentary affections that they are connected with part of the sympathetic system, especially with the fibers which are prominent in governing pigmentation. From the observation that vitiligo is incurable, and that chloasma, on the other hand, sometimes passes away spontaneously, the writer questions if there may not be an alteration of the involved sympathetic fibers in the former and merely an irritation in the latter.

Morphœa Herpetiformis.—Hutchinson[2] contributes a lengthy and valuable article on the subject of morphea, illustrated by some rare cases, one of which is here reproduced in color (see Plate 19). The subject was a woman aged 63: on the outer part of her foot and ankle there existed a large, irregularly-shaped, hardened patch of skin which had assumed a color of yellow ivory or smooth washleather. To the finger the affected skin felt board-like, and it was quite impossible to pinch it or lift it from the subjacent parts. A certain amount of contraction was present by which the three outer toes were drawn upward and the movements of the ankle were much impeded. At the margin of the affected part the skin was somewhat congested, and on the side of the leg, about 4 in. above the outer malleolus, there was an ulcer as large as a half-dollar. The condition had existed about 9 months. The disease began as a reddish ring on the dorsum of the foot; other lesions followed near it, and in 2 months the patch was well defined. Ulceration did not take place until 3 or 4 months later. The morbid process attained its height in 8 months, and during the 2 years which have subsequently elapsed the lesions have been slowly subsiding. The patient has been in fair health throughout and has had no similar patches elsewhere. The portion of the skin involved is exactly that supplied by the terminal twigs of the short saphena nerves, although the outlines of the patch are not much suggestive of nerve-distribution. The ulcer has since healed, and the whiteness and induration of the skin have to a very large extent disappeared. There remains, however, an almost scar-like condition of the affected skin, which is of a dusky color and is adherent to the parts beneath.

The writer believes that the term "herpetiform" may be suitably applied to all cases of morphea in which the changes are arranged in bands or after the manner of a corymb or panicle. More than a few of these cases are bilateral, and in a certain number the streaks may be arranged almost symmetrically. A tendency to be bilateral and to occur on many parts at once, the writer

[1] Monatsh. f. prakt. Dermat., Bd. xxii. No. 6. [2] Brit. Med. Jour., June 1, 1895.

observes, is very rare in zoster and very common in morphea, but this does not in the least invalidate the theory of the nerve-distribution of the latter. It proves only that many nerves may be affected at the same time. In all cases of multiple morphea which should be called "herpetiform" it will be observed that there are areas of healthy skin between the diseased portions, and that the affected areas are arranged according to the distribution of nerves. Mr. Hutchinson directs attention to rare cases of morphea which are distinctly opposed to the nerve-distribution theory, as in patches occasionally observed which are placed transversely. The name "morphea" is retained and preferred rather than the new one of "diffuse scleroderma." The latter is a pathologic term; it denotes a theory, and is applicable to many affections, and to only certain stages of each. Morphea is a clinical term, is well understood in its conventional signification, and has the great advantage of being almost meaningless as regards pathologic theory.

The subject of morphea is divided into three groups: 1. Herpetiform morphea, in which the patches are arranged on the pattern of herpes in streaks or bands, and, however extensively bilateral, seldom or never with exact symmetry; 2. Acroteric morphea, in which, although the whole skin may suffer more or less, the beginning and the greatest severity of the disease are almost invariably at the extremities. There is no location in streaks, symmetry is always marked, and Raynaud's phenomena are not unusual. This form is met with almost solely in adult women, and shows no tendency to spontaneous cure; 3. In this group are comprised hide-bound conditions of the skin in which the subcutaneous tissue, rather than the skin itself, is implicated. In this division are to be placed for the present certain cases which differ more or less definitely from both the preceding, and concerning the exact relations of which it is very difficult to speak. There are no ivory patches nor are the extremities affected in preference. Cases illustrating these several varieties are given. [This article is of particular interest and value because of the large, varied, and rare clinical material brought forward, and because the writer's observations on this disease must be considered as carrying great weight. Probably no observer living has had the opportunity of studying and following throughout life so many cases of morphea as Mr. Hutchinson.]

NEW GROWTHS.

Treatment of Nævus Unius Lateris.—Ransom[1] describes fully a case of this disease occurring in a woman of 20, occupying the upper portion of the trunk and the thigh. Various methods of removing the growths were tried, including curetting with and without the use of chromic acid; afterward electrolysis, the galvanocautery; the application of nitric, acetic, and chromic acids; but the most satisfactory procedure, both from the patient's standpoint of comfort and in the results obtained, was the use of a flat-pointed scissors. The skin was picked up between the thumb and fingers, and the top of the

[1] Jour. of Cut. and Gen.-urin. Dis., Apr., 1896.

ridge so made was snipped off, the cut being superficial and extending not quite through the skin proper.

Angiokeratoma of the Scrotum.—Fordyce[1] gives the notes and the histopathology of a case of this disease occurring in a man of 60. The scrotum was the seat of a great number of pinhead-sized, spherical, dark-purple tumors, arranged in a linear manner, as if following the superficial vascular supply of the affected region. Pressure caused the color of the majority of the tumors to disappear. They were distinctly raised above the surface of the skin, seeming to rest on it rather than to be imbedded in it. Some of them were covered by a slightly thickened horny layer, under which minute dark points could be seen, which gave the little tumors a warty-like appearance. There was no pain, itching, or other subjective symptoms. Puncture of the lesions was followed by slight bleeding. Dilatation of the capillary vessels is regarded by all the observers who have studied the disease as the primary and essential condition, the changes in the epidermis, especially the corneous layer, being secondary. Microscopic sections showed that spaces existed in the mucous layer of the epidermis in a marked degree, and that these spaces were caused probably by a down-growth of the cells of this layer, producing a constriction of the terminal loops and their resulting distention. The case reported differs from other similar cases in the localization of the disease, the absence of chilblains as a cause, and in the small amount of keratosis on the summits of the lesions. [These growths have been successfully treated by electrolytic puncture with the negative pole and by galvanocautery.]

Xanthoma Diabeticorum (so called); its Place among the Dermatoses.—Johnston[2] publishes an account of a case in which there were some peculiar features. The man, aged 57, was first seen in 1893, when he was suffering from diabetes; under treatment the amount of sugar was reduced. The xanthoma now appeared in the form of a few scattered papules on the elbow. Six months later the disease was widely disseminated on all parts except the face, chest, and abdomen. The eruption consisted of papules, dull red in color, becoming pink as they faded out; discrete or confluent, hard to the touch, and sharply defined; the lesions varied from a line in diameter to large raised patches on the soles ½ in. in diameter; many had the common yellowish-white apices; some had not, nor did pressure bring them out. Six months later many of the lesions had entirely vanished. In the autumn of the same year the man began to drink heavily; the amount of urine passed and the proportion of contained sugar increased day by day, until the latter reached 8%, when the eruption began to reappear. The activity of the process was clearly shown by the fiery-red color of the lesions, in marked contrast to the pale pink color seen during involution. The tint was compared to that of raw beef. At this time the nodules had coalesced into enormous plaques 4 by 8 in. in size, dotted here and there with the yellowish central point of the individual lesion. Not less than 2500 lesions now existed. Pressure produced a sensation of ten-

[1] Jour. of Cut. and Gen.-urin. Dis., Mar., 1896.

[2] Ibid., May, 1894, and Oct., 1895.

derness and prickling, and on account of the extreme hardness of the lesions he seemed to be lying on or sitting on a bag of shot. It was a curious and notable fact that while whisky was kept from him no involution took place, but if allowed about a pint and a half regularly each day improvement began. Dr. Johnston concludes that since xanthoma multiplex is an anomaly of formation, and that xanthoma diabeticorum is an inflammation due to an irritative process ending in a granulofatty degeneration, it is not proper to class them together as varieties of the same disease. Xanthoma multiplex is therefore properly placed and named, being really a xanthoma—that is, a yellow tumor. He would propose for the other the term "dermatitis xanthomatoides diabeticorum"—in other words, an inflammatory skin-disease which occurs in diabetics who have a personal idiosyncrasy leading to the formation, and which resembles xanthoma. It should thus be placed among the inflammations, and not the tumors.

Granuloma Fungoides.—Breakey [1] records a case of this disease (Fig.

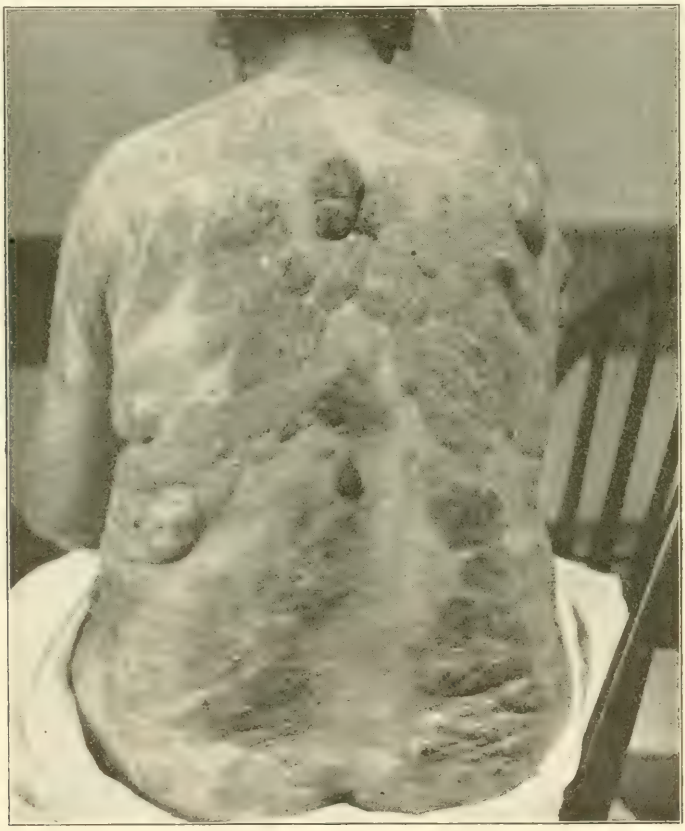


FIG. 163.—Granuloma fungoides (Breakey).

163) in a German woman of 56. The disease affecting the skin began 6 years before, at the beginning of the menopause, on the backs of hand and feet, in

[1] Jour. of Cut. and Gen.-urin. Dis., Aug., 1895.

the form of red spots which gradually spread all over the body, sometimes scaly, always itchy, never ulcerated. These macular lesions nearly all disappeared in the course of about 2 years, and the woman remained almost well for the next 2 years; then the spots broke out again nearly over the whole body at once, and have been better and worse since. The growths were more numerous and larger 2 or 3 months ago than at any other time. Many of the large tumors grew very rapidly (in from 2 days' to 2 weeks' time), and other tumors, half the size and thickness of the hand, have disappeared in a week. The general surface of the body, especially the trunk and extremities, is the seat of very numerous, variously sized and shaped erythematous infiltrated macules, tending to become flat or elevated nodular tumors. The lesions exist in all stages of development, for the most part in the form of large dollar- or hand-sized nodular infiltrations. Some of the more elevated tumors show erosions, from which reddened, hyperemic surfaces a bloody puriform discharge oozes. Here and there, especially in the axillæ and in the groins, on the thighs and on the lateral parts of the abdomen, are numerous large nodular, fungoid masses resembling flattened tomatoes. The legs and feet are much enlarged, and show dry, hard, dark-colored skin. There is not much tenderness and pain is absent, but the itching is constant and marked. The point of interest in this case concerns the diagnosis, the microscope tending to confirm the view of the growth being sarcomatous, while the clinical conditions and history point distinctly to granuloma fungoides. The photograph is reproduced. [While cases occasionally are met which exhibit the clinical symptoms and the histopathology of sarcoma, the majority are peculiar and do not show a close relationship to that disease, so that it is eminently proper that, for the present, both forms of the disease should be described separately. The clinical history of granuloma fungoides (or "mycosis fungoides," as French writers incline to call it, although there is not at present the least proof that it is mycotic) is in most cases remarkable, and is so different from that of any other disease as to entitle it to special study.]

Is this Leprosy?—McDougal of Ohio[1] presents 2 interesting cases (Fig. 164) upon which he raises a question of correct diagnosis. The first concerns a girl of 18. The present disease first manifested itself at the early age of 15 months in the form of "abscesses" in the legs. In 2 or 3 years the toes began to ulcerate and come off, and then the hands became involved. The flesh ulcerated from the fingers, leaving dry, blackened bones exposed. She menstruated with moderate regularity from the age of 14 until 1 year ago, when the menses stopped. At the date of the notes the left hand and lower forearm were swollen and rather firmly thickened, the hand and wrist being about twice the normal size. The distal phalanges were all lost except the little finger and thumb, and the stumps are healed. The hand is being self-amputated at the radiocarpal articulation by a narrow encircling ulcerative process, and the work is so near completion that only the ulnar vessels and some of the tendons remain (see photograph). Both surfaces are covered by

[1] Jour. of Am. Med. Assoc., Nov. 2, 1895.

granulations bathed with extremely foul-smelling pus, and are yet held in close apposition, except at the bordering skin, where some retraction has taken place in the healing process which has begun. The right hand and fingers were somewhat swollen and clubbed, and all the distal phalanges except those of the little finger and thumb were lost. The wrist-joint was somewhat deformed,



FIG. 164.—McDougal's cases of leprosy (?).

because of an unnatural prominence of the head of the ulna on the dorsal side. From the left foot the first and second toes were entirely lost, the third toe was off at the proximal phalangeal joint, and the fifth toe was all lost. On the plantar surface of the stump of the great toe was a thick, dark crust covering an unhealed ulcer. In the middle of the left sole was an ulcer the size of a silver half-dollar which reached deep into the foot and from which there came a very offensive discharge. From the right foot the great toe was lost, the second and third were off at middle of proximal phalanx, and the fourth was pointed upward, so that it was considerably out of line with the others. The little toe was not affected, except that it was involved in the general thickening of the

foot. All the affected members were more or less anesthetic, the thermal anesthesia being especially marked. There was a blister the size of a silver quarter-dollar on the back of the right arm just above the olecranon. The end of the tongue had been destroyed by ulcerations that had healed; the left side of lower lip and both wings of nose had suffered in the same way; the lower jaw had likewise suffered loss of bone, teeth, and gum; the eyes were weak, blinked, and vision was poor. A month later she was seen again, when she was sweating freely, though the house was cold, and her pulse was accelerated. There was great pain in neck and left leg. She had fallen several times limp and motionless and had choking spells. The hand was still further separated from the arm and hung downward. There was an eruption on left side of neck and front of right leg composed of dark, yellowish-brown macules thickly set and giving a dappled look. The self-amputated hand was given to the supervising surgeon general, U. S. Marine Hospital, the report being that the disease was "neither leprosy nor tuberculosis, which by exclusion throws some weight upon the suspicion of syphilis."

This patient had a sister 8 years of age who had been affected in the same manner for 3 years. Her feet were clubbed, her legs stocky; the great toe of left foot was off at the middle of the proximal phalanx, and was crusted. The distal phalanx of the second toe was lost; the right great toe was the same as the left. She manifested other symptoms similar to those which have been noted in her sister. The reporter thinks that Raynaud's disease, Morvan's disease or syringomyelia, and syphilis must be excluded, believing as concerns syphilis that no such history and combination of symptoms have ever been approached in any case of syphilis recorded. The father of the patients had a disease of the nose which, as far as the description given goes, the reporter thinks might have been syphilis, lupus, or some other disease, but he inclines to leprosy, and adds that, admitting syphilis might show itself by such unprecedented manifestations in a single case, it multiplies the improbabilities very greatly that two such unusual cases should occur together and be alike, for, considering the difference in duration, they are as nearly alike as two cases of any disease usually are. Photographs are here reproduced. [We hesitate to express a positive opinion on these very interesting cases, but we do not think that the diagnosis of lepra should be made without further investigation. The history is in favor of syphilis rather than lepra, the likelihood of the father having had lepra being hardly worthy of consideration.]

Leprosy in Nova Scotia.—Ashmead[1] brings forward considerable correspondence and a number of facts which go to show—1. That leprosy does not now exist among the Micmacs, and that they never were affected with this disease; 2. That in Nova Scotia leprosy exists in one Irish family in the island of Cape Breton, and only among the descendants of Scotch Highlanders in other parts of the province. The original MacCarthy leper came from New Brunswick, the supposed date of his leprosy being 1845; 3. That in the province of New Brunswick leprosy was introduced by a French vessel from

[1] Jour. Am. Med. Assoc., Feb. 1, 1896.

the Levant in the year 1758, and the disease still exists there among the "degenerated" French.

Leprosy with Special Reference to Kashmir.—Mitra[1] contrasts the prevalence of this disease in the valley of Kashmir with that met with in the Goojar country, situated on the slopes of the mountains not far distant. Rice forms the staple food of the Kashmirs, but meat and fish, fresh or dried, are also used, the boatmen on Woolar Lake living principally on fish. Syphilitic diseases are widespread among all classes, to the extent that the disease has almost assumed the magnitude of a national calamity. The habits of the people are very unclean, and there is utter disregard of public and private hygiene. Yet among these people leprosy is a rare disease. What may be the cause of this comparative immunity of the inhabitants of the Kashmir Valley from leprosy is difficult to determine, for this people are almost surrounded by leper neighbors, among whom the disease must have been prevalent for a long time. The Goojars reside on the slopes of the nearby mountains and are agriculturists, their food being Indian corn, wheat, and milk. Among them leprosy is a common disease. The prevalence of the disease in one people and its rarity in another neighboring community is difficult to account for. Concerning the contagiousness of leprosy, the writer states that he is familiar with 1 instance of a wife who acquired leprosy from an affected husband; 5 years after marriage the husband showed symptoms of leprosy; after another 5 years the wife became affected. On the other hand, he cites the instance of a family in which the grandmother suffered from a very bad type of ulcerative leprosy. She was nursed by her daughters and granddaughters. The old woman died 5 years ago. None of the family have become diseased, nor does he know of any case of contagion except that referred to. He thinks Hutchinson's fish-theory untenable, because the Goojars do not eat any fish. The treatment of the disease in this writer's hands has been unsatisfactory. Nerve-stretching is often useful, but it does not cure. He does not regard the disease as curable, but states that under proper medical care patients can be made comparatively free from symptoms. [The case cited in proof of the contagiousness of the disease is far from being convincing. Analyzed closely, it proves nothing beyond the fact that the disease manifested itself after a period of 5 years of married life in the wife, the husband having been leprous during that period. There are no facts that point to the mode of inoculation.]

A Promising Treatment of Leprosy.—Crocker[2] records 2 cases of leprosy in which hypodermic injections of mercuric chlorid produced improvement in the symptoms. A Pravaz syringeful of a solution containing 6 gr. to the ounce, the dose being $\frac{1}{5}$ gr., was injected deeply into the buttocks once a week. The results obtained were so favorable as to justify a further trial of the drug in other cases. In the first case in which this treatment was employed the diagnosis of syphilis had been made, and the improvement was so decided that it was supposed that that diagnosis was correct, but subsequent crusts proved that the disease was unquestionably leprosy.

[1] Indian Med. Rec., Aug. 1, 1895.

[2] Lancet, Aug. 8, 1896.

Lepra, especially as Met with in Iceland.—Ehlers,[1] whose observations were made chiefly in Iceland, does not believe in the theory advanced by Zambaco Pascha that lepra mutilans and Morvan's disease are one and the same malady. He does not believe that autocthonous leprosy exists, no proof being presented by observers like Zambaco Pascha in substantiation of this view. Leprosy still exists in France, as Leloir, Zambaco Pascha, and others have shown, and Ehlers thinks that the disease is probably carried by the fishermen of Bretagne, France, who to the number of 4000 travel annually to Iceland and back. He holds the view [like Armauer Hansen of Norway, the discoverer of the bacillus lepræ] that the malady is contagious, and that heredity plays no part in its production. [The brochure is copiously illustrated with photographs of Icelandic leprous subjects, showing the disease in its several varieties and in diverse stages. It is a valuable contribution to our knowledge of the etiology of lepra, and should be consulted by all who have in any way the care of lepers, foreign or indigenous. Proof of the contagiousness of the disease has been steadily accumulating during the past decade, until now no dermatologist questions the statement, but the mode of contagion and the conditions and circumstances under which it takes place are all still as mysterious as formerly. The various theories (as that of food, especially fish) that have been put forth lack general support.]

LUPUS ERYTHEMATOSUS.

Lupus Erythematosus.—Jenches,[2] after describing the general treatment which he had before employed in this case unsuccessfully, abandoned all external treatment and placed the patient upon a solution of phosphorus, according to the formula recommended by Bulkley,[3] as follows: Phosphorus, 6 gr.; absolute alcohol, 30 dr.; to be dissolved with the aid of heat and agitation, and then mixed, while still warm, with the following mixture, also warm: glycerol, 9½ oz.; alcohol, 1½ oz.; essence of peppermint, ½ oz. Each dram of this mixture contains $\frac{1}{20}$ gr. of phosphorus; of this 20 drops were first taken in water 3 times daily, after meals, the dose being gradually increased until at one time it reached 40 drops. A few weeks after the adoption of this remedy the burning and tenderness accompanying the skin-disease gradually disappeared. At the end of the second month the improvement was very noticeable, the dull red color previously so conspicuous fading. At the end of 5 months the improvement was so great that the patient considered himself cured. Thus, after several years of ineffectual external treatment, the disease had yielded to the internal employment of phosphorus. In administering phosphorus the action of the remedy upon the digestive organs should be carefully watched.

Sée[4] gives an excellent resume of our knowledge of this disease at the present time, and the article is replete with references to original literature on

[1] Abdruck. aus Dermat. Zeit., Bd. iii. [2] Boston M. and S. Jour., Nov. 28, 1895.
[3] In his article in the Am. Jour. of Med. Sci., Apr., 1893.
[4] Gaz. des Hôp., Oct. 12, 1895.

the subject. The name originally given to this disease by French observers as far back as 1828 was "erythema centrifugum," which was subsequently abandoned for the name now in common use given to it by Cazenave. The original description was that it was a spreading erythema tending to leave in the central area more or less atrophy of the skin. According to the writer, the disease has a chronic course, and is under the control of numerous influences which interfere with the peripheral circulation. The following varieties are referred to: 1. Erythematous; 2. Congestive, the "chilblain lupus" of Hutchinson; 3. Squamous, at times resembling certain forms of erythemato-squamous eczema; 4. Follicular or acneform, a variety which may pass into the deeper tissues, and may give rise to patches of almost cartilaginous induration, and thus approach in its general features "lupus vulgaris erythematoides" as described particularly by Leloir. The localities which the disease affects are considered: cases in which the face, scalp, and mucous membranes are affected are separated from those in which almost the whole body may be attacked, and which may run an acute course with a fatal issue. In discussing the diagnosis of this disease the writer calls attention to certain forms of superficial inflammation which occur in the course of tertiary syphilis which simulate lupus erythematosus very closely. In other cases lupus erythematosis may closely resemble superficial forms of lupus vulgaris. In describing the pathologic anatomy the entire absence of histologic or bacteriologic evidence of its direct dependence on the bacillus tuberculosis is confirmed. In considering the possible relations to tuberculosis the arguments that have been brought forward by those who regard this disease as being due to tubercular invasion, the evidence that has been advanced, are insufficient to establish the belief that lupus erythematosus is one of the tubercular manifestations, while, on the other hand, observations tend to show that it is due to a circulatory poison. Its relation to such circulatory disturbances as chilblain, heatblain, and Raynaud's disease is pointed out. The treatment recommended comprises both internal and local remedies. The internal use of phosphorus is recommended. During the active stage, that of spreading on the border, soothing remedies must be applied; later more active applications are tolerated and are advised. A resolvent plaster at night, followed by ointments containing resorcin, salicylic acid, or lactic acid, is recommended, as well as also scarification of the affected parts.

Malcolm Morris[1] at a meeting of the Dermatological Society of London exhibited a nurse, aged 46, with erythematous lupus which had followed the bites of mosquitoes. During a 6 months' residence in India she had been severely **bitten by mosquitoes** about the face and legs, which became inflamed in consequence. Some months later erythematous lupus began in the scar of a mosquito-bite on the side of the nose; a little later a patch started on the right cheek, and subsequently 3 more, all having the characteristic signs of the disease.

In a case of this disease in which other remedies have proved of no avail,

[1] Brit. Jour. of Dermat., Jan., 1896.

occurring in a woman 32 years of age, Legrain[1] employed **injections of sheep's serum successfully.** Two injections of 10 c.c. were employed at intervals of 5 days; 3 days after the first injection the spots began to grow pale, and 10 days after the second injection they had completely disappeared.

Lupus Erythematosus Disseminatus disappearing during Pregnancy.—Fordyce[2] records the case of a lady, aged 25, married 8 months, 6 months pregnant, always in good general health. Some months before marriage an erythematous lupus with much itching appeared on the face; 2 months after marriage, at the beginning of pregnancy, it showed itself also on the hands and arms. Shortly before delivery all evidences of the cutaneous disease had disappeared except the atrophic spots, which were surrounded by a pigmented zone. Another case of the same disease, which behaved in a similar manner during pregnancy, is referred to by the writer, but the disease recurred in a marked degree after delivery.

LUPUS VULGARIS.

Treatment.—Schultze[3] discusses especially the operation of **extirpation, followed by transplantation of skin** according to the Thiersch method. He summarizes his experience as follows: The radical operation in lupus of the face, with subsequent transplantation of skin, may be undertaken and carried out successfully. The same offers the greatest guarantee that the entire diseased skin will be removed; that the "combination treatment" recommended by Köhler is liable to be followed by relapses as readily as the treatment by the cautery or caustic ointments.

Sheild[4] showed a case of lupus vulgaris which he had successfully treated by **acid nitrate of mercury.** The patient, a woman 27 years of age, had suffered from lupus vulgaris of the nose for more than 4 years, and had undergone many scrapings. Acid nitrate of mercury, pure, had been applied on 6 occasions under cocain-anesthesia, with the result that the parts had healed over soundly, no trace of lupus tissue being now visible.

Branthomme[5] reports a case cured by the following method: Upon the upper part of the right hand and the lower part of the wrist was a lesion the size of a dollar, which had been treated unsuccessfully by various means for 14 months. Recourse was had to **potassium cantharidate,** a solution of which, prepared according to the following formula, was injected hypodermically: Cantharidate of potassa, 0.001 g.; hydrochlorate of cocain, 0.10 g.; distilled water, 10 g.; 1 c.cm. of this solution was given at each injection, and 8 injections were given in a period of 3 weeks. The injections were painful, and 1 was followed by abscess. The first 2 were followed by elevation of temperature—39.3° C. and 39° C.—and local reaction, which manifested itself by marked exudation. These phenomena did not appear at the third injection, but cicatrization then began and continued until a cure resulted.

[1] Ann. de Dermat. et de Syph., Jan., 1896.
[2] Jour. Cut. and Gen.-urin. Dis., Mar., 1896.
[3] Münch. med. Woch., Oct. 29, 1895.
[4] Brit. Jour. of Dermat., Feb., 1896.
[5] Ann. de Dermat. et de Syph., 1896, No. 1.

Ricketts[1] reports a case much benefited by **galvanism.** The injection of cocain may precede the operation, the latter consisting in the insertion of the galvanic needle in every direction through the diseased tissues, the operation being repeated until all evidence of redness has disappeared. The needle should extend through the integument, it not being necessary to attack anything beneath it. The writer believes that galvanism is to the lupus-bacillus what arsenic is to the cells of epithelioma. The chief objection to the treatment is the length of time required, which depends upon the area affected and the degree of tolerance on the part of the patient. With the use of cocain, however, the amount of galvanism used may be almost without limitation.

Serenine[2] has obtained good results in the treatment of this disease from the application of compresses saturated with pure beechwood **creasote** or with a 10 to 30% solution in glycerol or oil. The treatment possesses the great advantage of being easily carried out and of preventing much scarring. It is, however, slow in its action, and does not prevent relapses.

An Oidium in the Skin of a Case of Pseudolupus Vulgaris.—Gilchrist and Stokes[3] report in detail a case occurring upon the face in a man of 33 in which the disease of the skin resembled lupus vulgaris more than any other disease. Stained specimens showed an hypertrophy of the epidermis, throughout which numerous variously-sized, well-defined miliary abscesses were disseminated. Elsewhere the epidermis was considerably infiltrated with polynuclear leukocytes. Large collections of granulation-cells were massed in the corium, and a few miliary abscesses were noted in the upper portion of the cutis. In all the miliary abscesses, and also among the granulation-cells in the corium, were numbers of doubly-contoured, refractive, round and ovoid bodies, varying in size from 10 μ to 20 μ in diameter, many of them with buds and others with vacuoles. They were arranged singly or in groups, contained granular protoplasm, and simulated very closely blastomycetes. No tubercle-bacilli could be found. The writers conclude that this extensive cutaneous disease was caused by the presence and growth in the tissues of a species of oidium, and that this is the only example in literature of a pure cutaneous disease which has been shown to be caused by a species of oidium, and the third example in which lesions of the human skin have been produced by organisms allied to the yeast fungi, Busse's case and Gilchrist's case being the other 2.

Tuberculosis of the Skin and Cutaneous Manifestations occurring in Scrofulous Subjects.—Noyes[4] considers the subject in two groups: in the first the diseases of the skin are directly due to the influence of the tubercle-bacillus. In this group are found lupus vulgaris, scrofuloderma, verruca necrogenica, acute tubercular ulceration, and tubercular lymphangitis. Group 2 comprises lesions occurring in scrofulous subjects which are predisposed to this disease by a certain peculiarity of tissue, but are not proved to be due to the direct action of the tubercle-bacillus. Here are arranged erythema induratum (Bazin), lichen scrofulosorum, scrofulous pustuloderma (acne scrof-

[1] Jour. Am. Med. Assoc., Jan. 18, 1896.
[2] La Sem. méd., 1895, vol. xv. p. 198.
[3] Bull. of Johns Hopkins Hosp., July, 1896.
[4] Intercol. Med. Jour., Apr. 20, 1896.

ulosorum, etc.). In lupus vulgaris the elementary lesion is situated deep in the corium, and consists of giant, lymphoid, and formative cells in a fibrocellular reticulum. All the structures that are found in miliary tubercle are present in lupus. Bacilli are found in the histologic elements just described which differ in no way morphologically from tubercle-bacilli. They exist in very small numbers and are found with the greatest difficulty, but in spite of their sparse distribution they are capable of setting up generalized tuberculosis in susceptible animals. On clinical grounds there is very strong evidence of the identity of the organism which produces the pathologic processes in lupus and phthisis. Many cases of direct and indirect inoculation are recorded where phthisical patients have transferred the disease in the form of lupus vulgaris. In Australia lupus vulgaris is much rarer and less severe than in England. Noyes would account for the comparative rarity of true lupus vulgaris and for its milder type in Australia by—1. The greater exposure of its inhabitants to direct sunlight; 2. The absence of tendency to hyperemia and stagnation in exposed parts due to the effect of cold; 3. Increased tissue-resistance. It is true that lupus is no respecter of persons, so far as the rich and the poor are concerned, but it is also true that it assumes a much more severe type amongst the poor, half-starved, ill-nourished individuals so common in the largest cities of Europe and so rare in the cities of Australia.

By scrofuloderma is meant a suppurating dermatitis which occurs in scrofulous individuals, attacking the skin either in connection with more deeply-seated lesions, as strumous glands or tubercular processes in bone or joints, or independently of any underlying tubercular lesions. Verruca necrogenica, anatomical tubercle, tuberculosis verrucosa cutis (Riehl and Paltauf), and lupus verrucosus are all bacteriologically and histologically identical. Verruca necrogenica occurs for the most part, but not always, on the hands of those who handle animal tissue in which the tubercle-bacillus exists—pathologists, butchers, and cooks.

Acute tubercular ulceration is observed only in advanced cases of pulmonary or intestinal tuberculosis. The ulcer is irregular in shape and covered with granulations of a yellow color. It usually occurs about the oral or anal orifice, occasionally elsewhere. It is very intractable, and not infrequently spreads beyond the original limits. The cause is an autoinoculation. The tubercle-bacillus can be demonstrated. Tubercular lymphangitis is a rare condition in which the tubercle-bacillus would seem to find its culture media in the lymphatic vascular trunks. More or less impediment to the flow of lymph takes place, with consequent elephantiasis of the part. Nodules with a pink, dusky red, or violaceous color occur in the course of the affected lymphatics. They ulcerate and discharge their contents in the form of a purulent-looking matter. Sometimes lymph is discharged in which the bacillus may be found.

Whether the tubercle-bacillus has any direct action in the production of the nodules of erythema induratum of the scrofulous is a point not yet settled. Under the head of "scrofulous pustuloderma" Noyes includes many pustular affections occurring in scrofulous subjects. He thinks they are possibly all

phases of one and the same process, though differing in detail. They all have these points in common: The lesions are eventually pustular; they occur in connection with the follicles of the skin, are more or less violaceous in color, leave scars, and are observed in scrofulous subjects.

Case of Blastomycetic Dermatitis in Man.—Gilchrist[1] describes the histopathology of a section of skin taken from a case which was under the care of Dr. Duhring, by whom it was diagnosed clinically as a typical example of chronic scrofuloderma of the back of the hand. Gilchrist was unable to demonstrate in the tissues the presence of the tubercle-bacillus. Numerous curious bodies were found distributed here and there throughout all the sections. They presented all the appearances of parasites. The surface of the sections of skin was very irregular, showed well-marked prominences and depressions, and was covered with irregular masses of detritus, which consisted of small collections of pus, detached epithelial cells, fibrin, coagulated albumin, and comparatively large masses of red blood-corpuscles. The stratum corneum was well marked and was infiltrated with small collections of pus, while scattered about were numerous polynuclear leukocytes. This layer was separated in places from the subjacent epithelium by a similar inflammatory deposit. It was in the mucous layer, however, that the chief pathological changes were observed. The epithelium was enormously hypertrophied. The most noticeable feature in the mucous layer was the presence of numerous well-defined miliary abscesses of different sizes. The contents consisted of polynuclear leukocytes, nuclear detritus, a few detached epithelial cells, now and then a giant-cell, a number of peculiar nuclear cells, and the peculiar organisms which characterize this disease. These organisms, which appeared to have a causal connection with this disease, were almost always present in the miliary abscesses and scattered throughout the corium, but none were found on the surface of the skin. They were always surrounded by inflammatory material. The number present varied, as many as 15 having been found in one abscess, though the average was only 4 to 6. They were observed usually in pairs of unequal size or sometimes in small groups. They consisted of a capsule, a light peripheral zone, protoplasm, and a vacuole. That the organisms are certainly not the results of any form of degeneration of epithelial cells is clear for the following reasons: 1. They were found in the corium as well as in the epidermis; 2. They were always surrounded by inflammatory material wherever they were found, especially in the miliary abscesses; 3. Their reproduction was carried on by gemmation; 4. They were much smaller than epithelial cells, approaching more nearly the size of the nucleus of these cells; 5. They were never found intracellular (*i. e.* with reference to epithelial cells) or intranuclear; 6. They were often found enclosed in giant-cells in the abscesses and in the corium; 7. They had in the adult form certain constant characteristics—namely, a well-defined capsule, a clear space between it and the protoplasm, and a well-marked vacuole; 8. The occurrence in the same sections of so many altered epithelial cells rendered comparison easy and brought out the

[1] Johns Hopkins Hosp. Rep., vol. i.

marked differences which exist between these and the bodies in question; 9. Treatment with caustic potash showed them to be resistant bodies having a double contour. The main characteristics of the organism, especially in its mode of reproduction by gemmation and its comparatively small size, point unmistakably to a classification among the yeasts or blastomycetes.

Two Cases of Protozoan (Coccidioidal) Infection of the Skin and other Organs.—Rixford and Gilchrist[1] contribute elaborate and important articles, with exhaustive pathologic research, on the subject. The first patient was a man aged 40, a native of Fayal, Azores, who went to California in 1886 as a laborer, at which date the disease of the skin began in the form of a large sore 2½ by 5 in. on the back of the neck, and also probably one on the forehead. There was no history of syphilis or tuberculosis. The leading points of the case may be summed up as follows: The disease was one of fatal general protozoan (coccidioidal) infection, which remained localized on the back of the neck for 5 or 6 years, when other similar lesions appeared on the eyebrows, nose, cheek, ear, and back of the right hand. On various occasions exacerbation occurred. The lesions remained localized to the skin for 8 or 9 years before the neighboring lymphatic glands became involved, up to which period the patient's general health continued good. The character of the cutaneous lesions resembled somewhat closely those of tuberculosis cutis. Following the infection of the lymphatic glands the temperature began to rise (102–103° F.) and assumed an intermittent character, the general health now becoming impaired. Both eyes were destroyed by extension of the disease from the eyebrows. The internal organs affected, as shown by the autopsy, were the lungs and pleura, the adrenals, testes, epididymes, seminal vesicles, prostate, and lymphatics following the vas deferens, the surface of the liver, the spleen, the peritoneal surface of the diaphragm, the peritoneum, the lymphatic glands, and even the bone-tissue. The entire alimentary canal and mesenteric glands remained practically normal throughout the course of the disease. There was a close resemblance, amounting even to histologic identity, between many of the nodules produced by the protozoa in the lungs and other internal organs and genuine tubercles. Both to the naked eye and microscopically the nodules were indistinguishable from tubercles, except that they contained the protozoan organisms and did not contain tubercle-bacilli. These lesions therefore fall into the group of pseudotuberculosis. The organisms found were spherical, unicellular bodies, and consisted (in the incapsulated condition) of a thick, doubly-contoured capsule which enclosed a finely granular protoplasm. The parasites developed by sporulation, and often as many as 100 small spores or sporozoites were set free by the bursting of the capsule. No nucleus could be demonstrated. The parasites were found both intracellular and, as a rule, extracellular. Some of the inoculation-experiments in animals were successful. Photographs from life of the patient, as well as numerous photomicrographs of the parasites, in situ and isolated, accompany the report.

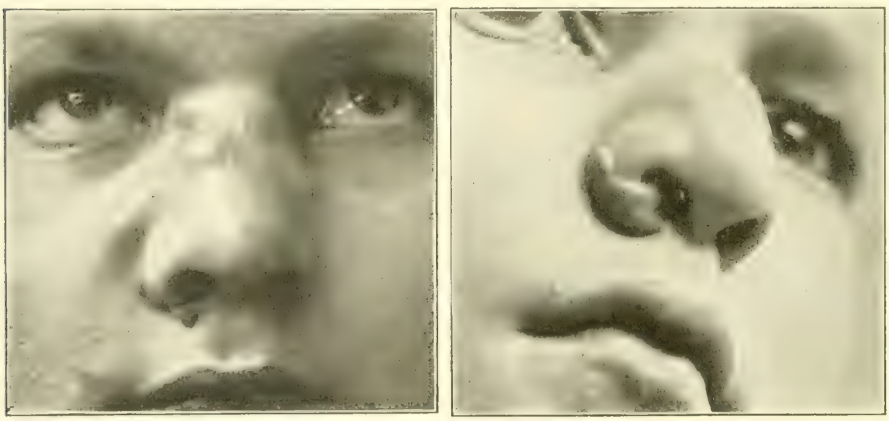
The second case occurred in a man aged 33, who, as in the first case, was a

[1] Johns Hopkins Hosp. Rep., vol. i.

native of the Azores and who resided in California. According to his statement, an attack of hematemesis was followed 4 weeks later by an eruption on the left side of the forehead of two papules, which rapidly increased in size. Other skin-lesions appeared on the face, scalp, trunk, and arms to the number of 30; most of these lesions presented clinical appearances similar to those noted in Case 1, except that there was an absence of fungating masses. Six weeks later the urine showed blood, according to the patient's statement. Two months after the first eruption appeared the lymphatic glands of the neck became implicated. No pulmonary symptoms developed. The weakness increased rapidly and the patient suffered from insomnia and night-sweats. The urine at this stage was normal. In watching the eruption fresh spots were seen to appear as papules, which became capped by small vesicles and then became crusted; in this way a small ulcer was formed with somewhat undermined edges and a base which consisted of uniformly enlarged papillæ. The patient died 12 weeks after the appearance of the first skin-lesion. There was no autopsy, but a portion of skin was removed from a patch over the clavicle, and the section revealed some very interesting features. In the epidermis were numerous well-defined, variously-sized miliary abscesses which contained protozoa. The upper part of the corium only was affected, in the form of an extremely acute inflammatory exudation which displaced the normal structure. Protozoa were found in abundance in the corium among the inflammatory products near the vessels, and particularly throughout the central portion of the ulcer. One section showed the middle of the ulcer so full of these large protozoa that the microscopic field hardly consisted of anything else. Giant-cells were almost entirely absent. The protozoa, although at first appearance they were similar to those found in Case 1, differed from them mainly in this respect, that whereas the pathological changes caused by their presence in Case 1 were of a chronic character, in Case 2 they had given rise to a process which was distinctly acute. Their mode of development was practically the same in both instances; those in Case 2 were generally larger. The sporulation forms, particularly those in which the capsule was just about to rupture or had just ruptured, were very numerous, whereas in Case 1 they were found only after some searching. Another special feature of the second variety of protozoan was the presence of a well-defined space or vacuole situated in the centre of the organism, which was seen in the adult encysted protozoon, and could be observed in nearly all the stages of its development into sporozoites. Considering the enormous number of protozoa, and particularly of free sporozoites, present in every diseased area, one cannot see how such a patient could escape general infection. Photographs of the patient from life, sections of the skin, and illustrations of the protozoa in different stages of development, in situ and isolated, are given. [These cases are of great interest, and open up a new field in histopathology. Not only were the clinical features, it would seem, *sui generis*, differing from known forms of tuberculosis cutis, scrofuloderma, lupus, and other allied clinical forms of disease, but the discoveries render the disease probably a new one. Considering the great numbers

of the protozoa and their peculiar forms, it is not likely they would escape detection by skilled microscopists. We have had the opportunity of examining sections showing the protozoa found.]

Case of Rhinoscleroma originating in the United States.—Wende[1] reports a case of rhinoscleroma occurring in the person of a boy, 11 years of age, born in the United States of American parents. The family history was good and he was apparently robust. The disease had existed $1\frac{1}{2}$ years, and was progressive in its nature. It began as a pink spot below the right naris, and was free from pain. At the end of 3 months it was perceptibly elevated, and had developed into a pronounced ridge, which gradually extended to the left side of the nose. The lesion was superficial, but the underlying tissue was infiltrated and was very hard. Upon the right side of the nose were two sharply-defined ridges measuring about $1\frac{3}{4}$ in. in length, having between them a small area of sound skin. Upon the left side of the nose was a single ridge having a uniform width of nearly $\frac{1}{2}$ in. The right ala was uniformly thickened, causing a narrowing of the opening of the nostrils (see Figs. 165, 166). The result of the bacteriologic examination was still in doubt at the time of the report.



Figs. 165, 166.—Rhinoscleroma (Wende).

Freudenthal[2] also records a case (with photograph) of the same disease occurring in a Polish Jew, the lesion, occupying the dorsum of the nose, being at first mistaken for a syphilitic gummatous infiltration. The bacillus was found by Buxton, and, as in other instances by other bacteriologists, the resemblance to Friedländer's pneumococcus was noted.

FOLLICULAR AND GLANDULAR DISEASES.

Keratosis Follicularis (Psorospermose Folliculaire Vegetante of Darier).—Bowen[3] gives notes of a new case of this rare dermatosis. [The first cases were described almost simultaneously by Darier and White about 7

[1] Jour. of Cut. and Gen.-urin. Dis., Mar., 1896. [2] N. Y. Med. Jour., Feb. 1, 1869.
[3] Jour. of Cut. and Gen.-urin. Dis., June, 1896.

years ago, since which date about 20 cases have been recorded, contributed by French, German, Norwegian, and American observers; 4 cases have been observed in America.] Bowen's case was a woman 29 years of age, living near Boston, fairly nourished, and of a swarthy complexion. The face had an aspect characteristic of the disease. It was covered with lesions that did not vary much in color from that of the normal skin, although there was a distinct darkening of the skin as a whole, which looked coarse, furrowed, and greasy. The individual lesions consisted of small, greasy-looking papules, on an average the size of a pin's head. The center of each papule contained a fatty-looking mass or plug. In some the tip of the lesion showed a minute pustule instead of the greasy plug. To the finger the sensation was that of a nutmeg-grater. Upon the trunk the parts especially affected were the sternal, interscapular, and sacral regions and the median line of the abdomen from umbilicus to pubes. Here the lesions were numerous and closely aggregated. They were dark and greasy-looking, and were less elevated than those on the face. Some of them bore a strong resemblance to keratosis pilaris. The labia majora were the seat of prominent lesions, some of them the size of a large pea, while through the confluence of the lesions the labia had become much thickened and papillomatous. Close inspection showed that the greater number of the lesions were grouped about the follicular orifices; in other words, that the affection was essentially a follicular one.

Bowen thinks it probable that it always begins early in life. Of the 20 cases collected, 13 were males and 7 females. The disease is one of the most obstinate of known dermatoses. No one has been able to record a cure. The point upon which there has been much diversity of opinion is whether the lesions are essentially follicular or not. White, whose first case was published before Darier's article had appeared, named the disease keratosis follicularis, and stated that at the beginning of the process the lesions were in no way to be distinguished from those of simple keratosis pilaris. Boeck and most of the other writers have been unable to determine that the lesions were confined to the follicles. Bowen is inclined to adhere to his and White's original position —namely, that the process is primarily and essentially a keratosis of the mouths of the follicles. Both clinically and histologically the disease appears to resemble the anomalies of development, as exemplified by ichthyosis, more closely than any other group.

Pityriasis Rubra Pilaris (Devergie).—West and Liddell[1] both report cases of this rare disease. In the case of West arsenic was tried in full doses for several weeks without any improvement; the administration of thyroid extract, however, was quickly followed by relief of the symptoms to such an extent that at the end of 5 weeks the patient was reported to have been in excellent health and on the way to complete recovery. Dr. Liddell's case greatly improved under the use of sulphur baths at Harrogate and the application of resorcin ointment, with the subsequent use of a salicylic and creasote ointment. A study of the histopathology of the disease showed that the hairs were greatly

[1] Brit. Jour. of Dermat., Sept. 18, 1895.

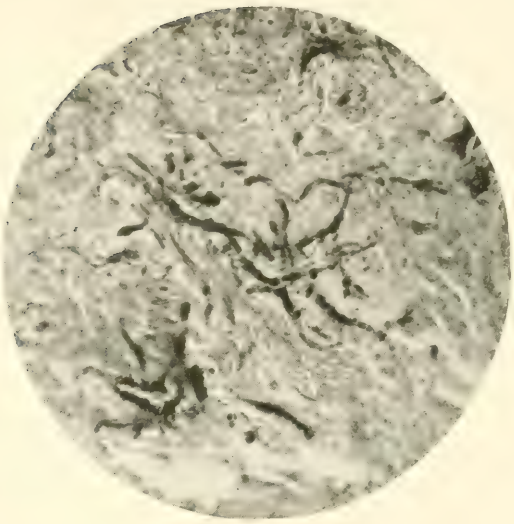
changed, mainly by an increased keratinization of the outer root-sheath, causing a thickening of the hair and also of the lower portion of the follicle. There was general atrophy of the sweat-glands, including obstruction of the lumina and wasting of the cells in the coils. The muscles of the hairs were also atrophic.

Keratosis Universalis Multiformis (Pityriasis Pilaris Rubra of Besnier, Lichen Ruber Acuminatus of Kaposi).—Lewin,[1] after making an exhaustive and critical study of this much-vexed disease, especially as concerns the identity of the disease to which Besnier and other competent French observers have given the name pityriasis pilaris rubra, and Kaposi lichen ruber acuminatus, comes to the following conclusion: That the disease called pityriasis pilaris by French observers is not a new disease, but has been before described with other names by several writers, as also has the lichen ruber acuminatus described by Kaposi. The lichen ruber of Hebra is a disease which, without the employment for its cure of arsenic, is absolutely fatal, but by its use is a curable disease. The name pityriasis pilaris is equally unjustifiable with that of lichen ruber acuminatus, inasmuch as both are keratoses, and may with as much right as the various other phases of keratosis be so called, and this particular form be designated with the name "keratosis universalis multiformis." In favor of the keratosic process the increase of the keratohyalin and the decrease of the eleidin, as well as the other clinical features, speak. The decrease of the urea and the increase of uric acid in the urine, the presence of hippuric acid in the cutaneous crusts, and their relation to keratosis are possibly due to increased consumption of oxygen in the augmented formation of epidermis.

Unique Case of Agminate Folliculitis of Parasitic Origin.—Hartzell[2] reports an unusual case of folliculitis due to the invasion of the follicles of the skin by the trichophyton or a very similar fungus. The patient was a man of 38, in the employ of a railroad company as a repairer of signals; 5 or 6 weeks before coming under observation a few small pustules on the inner side of the left leg just above the internal malleolus appeared. Through the implication of adjacent follicles these rapidly grew into a palm-sized patch elevated $\frac{1}{8}$ in. above the surrounding healthy parts. Other patches of a similar kind appeared upon various parts of the leg, and these continued to enlarge and to coalesce until they covered at least two-thirds of the surface of the leg (see Plate 20, Fig. 2). Marked pain attended the eruption, so that the patient was compelled to give up his work for a considerable time, being unable to walk. Microscopic examination of excised portions showed marked inflammatory changes in and about the follicles, and, what was most interesting, an abundance of spores and mycelium, the latter being especially plentiful (Plate 20, Fig. 1). Under the use of a sulphur ointment, 1 dram to the ounce, improvement was immediate and a cure followed within a few weeks. [The case illustrates a very rare form of disease, one whose nature would probably never

[1] Berl. klin. Woch., Sept. 16 and 23, 1895.

[2] Jour. of Cut. and Gen.-urin. Dis., Nov., 1895.



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FIG. 1.—Mycelium in follicle (Hartzell). FIG. 2.—Dr. M. B. Hartzell's case of agminate folliculitis.

have been explained without the removal of a section of skin from the living subject and the use of the microscope. It demonstrates, moreover, that the trichophyton fungus is capable of setting up still another form of follicular and cutaneous inflammation, the list having been considerably enlarged of late.]

Case of Undescribed Papuloulcerative, Follicular, Hyphomycetic Disease of the Skin.—Under this title Duhring and Hartzell[1] report an undescribed form of mycosis of the skin. The patient was a boy of 15, employed in a mill. Upon the sides of the neck were patches of chronically inflamed, papulo-ulcerative, slightly crusted lesions. The disease, which had existed for 3 years, had produced slight whitish, pitted, irregularly-shaped scars. It resembled a mild expression of lupus vulgaris verrucosus more than any other disease. There was no resemblance to tinea circinata nor to tinea sycosis. A microscopic examination of several of the excised lesions disclosed the presence of spores and mycelium resembling in a general way the common trichophyton fungus of ringworm of the scalp and general surface, except that they were much larger. The fungus was found in cavities occupying the site of hair-follicles.

Etiology and Histopathology of Parasitic Sycosis.—Ullmann[2] has studied 8 cases of parasitic sycosis, the results coinciding with those of Sabouraud as to the existence of an ectotrichial form of trichophytosis, in which the fungus remains in the hair-sheath and does not enter the hair-substance. The various degrees of virulence of the fungus, the sensitiveness of individual skins, age, race, locality, reaction of the sweat, and cleanliness or neglect of the skin are sufficient to explain the intensity of the process and the extent of the cutaneous disease. In the cases examined the fungus, in all except 1, was that described by Sabouraud as "tricophyton mégalasporon pyogène du cheval à culture blanche;" in 2 of the cases staphylococci were also present. One case possessed all the clinical features of impetigo contagiosa, and was so diagnosed until the microscope showed the trichophyton; from which it is believed that one variety of impetigo may be due to this fungus, and another to staphylococci.

Changes of an inflammatory character were found around the hair-follicle, due probably to the action of toxins produced by the fungus. At first there occurs a perifolliculitis, with mononuclear, and later polynuclear, leukocytes, which penetrate the internal and external root-sheaths, the follicle becoming enlarged, the walls thinned and ultimately obliterated. With suppuration of the follicle the hair falls out and the sebaceous glands are destroyed. Attention is directed to two notable features in the process, one being the effects produced at a considerable distance from the fungus in the follicle, explicable only by the theory that the fungus forms a toxin which sets up inflammation in the tissues about the follicle; the other is the existence of giant-cells.

Etiology of Acne.—Lomry,[3] after a bacteriologic examination of the lesions of pustular acne and of comedo, finds that the staphylococcus pyogenes

[1] Am. Jour. of Med. Sci., Mar., 1895. [2] Wien. klin. Woch., Nos. 18-20, 1896.
[3] Dermat. Zeit., Bd. iii. H. 4.

albus is constantly present in the pustules of acne. There is also occasionally present, always in small numbers, a yeast-fungus and a small bacillus. In ordinary comedo, unaccompanied by inflammation, microbes are present in abundance, the staphylococcus albus being always at hand, but not to such a degree as in pustular acne. When inflammation occurs in comedo a diminution in the number of kinds of microbic organisms takes place. The presence of certain microbes, however, does not explain the occurrence of the disease, for the skin of persons who are free of acne shows microbes as abundantly as those who are affected with acne. The staphylococcus, being met with in many other diseases of the skin, cannot be regarded as the specific cause of the acne. A suitable soil must be provided. The author is of opinion that Unna's special bacillus is a mild variety of the bacterium coli, and that the contrast of acne with other diseases of the skin with staphylococci may be accounted for by a difference in the virulence of the microbes.

Massage in the Treatment of Acne of the Face.—Pospelow[1] calls attention to the good results which he has obtained from massage of the skin of the face in the treatment of acne in this region. By this means the lessened tone of the skin, and especially of the sebaceous glands, is increased, and the thickened sebaceous matter expressed from the ducts. The rubbing should not be done without method, and should follow the direction of the gland-ducts and the muscle-fibers of the skin in order that the sebum may be expressed from the glands. It should be employed for 10 minutes, morning and evening, for several months, until the tone of the skin is restored and the openings of the ducts have returned to their normal size.

Alcohol in the Treatment of Acne Rosacea.—Abraham[2] recommends a treatment which was only employed in the first two grades, and was successful; it was, moreover, free from all objectionable features. It consists in the employment of 95% alcohol for local subcutaneous injections. The immediate effect of the injection is a swelling and anemia of the area subjected to it. This condition lasts but a few moments, the next occurrence being an increased redness of the same part of the skin subjected to treatment. This redness lasts from a ½ hour to 3 or 4 hours; thereafter it gradually disappears, the treated skin area assuming its usual color. The dilated blood-vessels and papules will be found after repeated injections to undergo sure but slow obliteration, until finally the whole lesion disappears and the affected integument appears greatly improved or normal. The treatment in some cases lasts 8 or 10 weeks; in others a great deal longer. A clean hypodermic syringe with a thin needle is needed. The syringe is filled with 20 or 30 drops of alcohol, 95% strength. The part of the nose or cheek selected to be operated on is pinched up and the injection made. Not more than 30 drops of the fluid are required, nor more than 3 injections a week. By being aseptic there will be no inflammation, and in the absence of it the remedy can be applied to the same place repeatedly until the desired result—a cure—is attained. The first form of rosacea, in which hyperemia of the skin is the

[1] Dermat. Zeit., Bd. ii. H. 3.

[2] Am. Med.-Surg. Bull., May 16, 1896.

main and only lesion, is the most amenable to this treatment. The second grade requires greater perseverance, on account of the papules and pustules present. Both grades, however, tolerate it well. This method of treatment is not put forth as a specific, but the reporter has had uniform success in his cases, and the cleanliness and convenience that this treatment in a measure offers alike to physician and patient certainly entitle it to consideration and trial. The histories of 6 cases which were cured are given.

On the Topical Treatment of Acne.—Bronson,[1] after discussing the bacteriologic aspect of the disease and its general pathology, states that the prime indications for its treatment are—1. Reduction of the hyperkeratosis; 2. Removal of the comedones; 3. Disinfection of the follicles; and, finally, the employment of such local or general antiphlogistic measures as the case may require. Of these objects, the first two are accomplished by mechanic means, the first three by topical measures, while the last may require both topical and general treatment. The curet is an indispensable implement in the management of the disease, Dr. Bronson preferring an elongated olive-shaped instrument with a large fenestra, that is easily cleaned, and the edges, which are but slightly curved, are sharp. Those in common use are too small. The skin is put on the stretch, and the edge is then swept with rapid free-hand strokes over the affected surface, with the effect of planing off the cutaneous elevations, and also of clipping off the summits of many pustules and removing at once the horny cap that seals the orifices of the distended sebaceous follicles. By this means is accomplished in an instant what would be less thoroughly effected by applications of salves, soaps, hot water, or steam for days or weeks. In addition, when comedo exists each follicle must be treated separately by the use of the comedo-extractor or presses, for which purpose the curet described answers the purpose. In refractory cases, in which the comedones are dry and the horny layer of the skin dense, a preparation composed of vinegar 2 parts, glycerol 3 parts, and kaolin 4 parts may first be applied. After the mechanic treatment has been thoroughly carried out at one or more sittings disinfection is to be practised, the skin being bathed with a 1 : 1000 solution of mercuric chlorid or a 1% soap. If there are many pustules, he uses solution of hydrogen dioxid before the sublimate wash is applied. For the home treatment sulphur and resorcin are relied upon. The compound zinc-sulphid lotion (1 dram each of potassium sulphid and zinc sulphate to 4 oz. of water) is highly esteemed; resorcin is used as an aqueous or alcoholic 3 or 4% lotion.

During the course of the mechanic treatment Lassar's zinc-starch-petrolatum paste should be applied at night as an antiphlogistic remedy, and rubbed off in the morning with petrolatum. Simple dusting powders are also valuable. [The article deals with the local treatment only, and may be regarded as a plan of therapeusis based upon the pathology and bacteriology of the disease. No mention is made of the varieties of acne against which the methods suggested are particularly applicable. The skin is treated vigorously and not

[1] N. Y. Med. Jour., Mar. 28, 1896.

spared by this method. No discrimination is made by the writer between the several anatomic, etiologic, and pathologic varieties of the disease.]

Adenoma Sebaceum with Mollusca Fibrosa.—The case reported by Anderson[1] occurred in a male, was noncongenital, was not associated with dyspepsia or telangiectasis, and the patient's intellectual condition was not deficient. The adenomata began to appear at the age of 7, and several years later small fibrous tumors appeared on the body. They were treated successfully by excision.

A New Treatment of Hyperidrosis.—Frank,[2] after considering the treatment of this affection by various other means, including the chlorated combinations with ether and the preparations of methylic acid, calls attention to the value of formalin in from 10 to 20% alcoholic solution, which usually cures hyperidrosis very promptly. He has made use of tannoform (a powder consisting of formalin and tannin) very successfully in about 50 cases, especially in bromidrosis of the feet.

Treatment of Hyperidrosis.—M. L. Hensner[3] recommends the following wash, applied by means of a cotton tampon for local conditions and in the form of a spray for generalized sweating: Balsam of Peru, 15 gr.; formic acid, 75 gr.; chloral, 75 gr.; alcohol, 1 oz. In refractory localized forms the wash may be doubled, and 15 gr. of trichloracetic acid may be added.

DISEASES OF THE HAIR AND NAILS.

Change of Color of the Hair from White to Black, due to Exposure to Cold and Exhaustion.—Griffiths[4] reports the case of a man of 65, an engineer in a city fire department, in whom, after prolonged exposure to cold and consequent great exhaustion, the hair turned from white to black within a few hours. The change in color was not due to any foreign matter (such as smoke or soot), since repeated washings were without effect.

Two Cases of Piedra Nostras.—Unna[5] describes 2 cases of this disease, which is rarely encountered in Europe. The fungus is saprophytic on the hair and does not enter the interior. Sections of the hair showed a dense collection of round, ovoid spores, looking as if stuck on the hair. In both cases the fungus was cultivated. In 1 the spores and hyphæ were smaller and finer than in the other. In a case of true Columbian piedra, fungus of a very large-spored variety was found.

Pityriasis Alba Atrophicans.—Krösing[6] reports a case of this very rare affection. The subject was a man 40 years of age, in good general health, without history of inherited tendency to cutaneous disease. The alterations in the skin occurred on both lower extremities and were symmetrical. Around the ankles the skin was livid, thin, tightly stretched, and covered with variously sized, grayish-white, shining, for the most part adherent, scales. Owing to the stretching of the skin, the natural marking had disappeared, and it was no

[1] Brit. Jour. of Dermat., Oct., 1895.
[2] Monat. f. prakt. Dermat., Bd. xxii., Feb., 1896.
[3] La Sem. méd., 1895, xv. p. 222.
[4] Jour. of Cut. and Gen.-urin. Dis., Sept., 1895.
[5] Lewin's Festschr., Berlin, 1896.
[6] Dermat. Zeit., 1896, Bd. iii. H. 1.

longer possible to pinch it up in folds. The subcutaneous fat was also atrophied, and the skin seemed to lie closely upon the tendons and bone. Movements of the foot were hindered by the tightness of the skin. The venous network was clearly visible through the thin skin. Upon the leg the scales were more delicate, thinner, bran-like, and less firmly adherent, so that they could be in great part removed with the hand. The muscles of the calf were also diminished in volume. In the hollow of the knee the skin was tightly stretched, so that extension of the leg was accomplished with difficulty. Upon the thigh the changes were less marked and were of more recent origin. On both sides the affection reached in front to the groin, behind to the lower border of the gluteal muscles. Sensibility, patellar reflex, and electrical excitability were normal. The disease began when the patient was 13 years of age on the left ankle, with the appearance of a dry, scaling, pale spot which burned slightly rather than itched. This spot had never been reddened, swollen, or moist, nor had any other change in the skin, as papules or vesicles, preceded the scales. The scaling gradually extended over the entire lower extremity. The disease did not begin upon both extremities at the same time, the left one having been affected 10 years before the right one. Histological examination of excised portions of the altered skin showed marked atrophy of all parts, but no evidences of inflammatory change. [The name given to the disease by the reporter indicates sufficiently the principal clinical features of this extremely rare dermatosis, which is at present practically unknown in the United States. It probably belongs to the group of diseases of which Buchwald's and Bronson's cases of cutaneous atrophy, and also morphea, are notable examples.]

Bacteriologic Investigation of a Case of Trichorrhexis Nodosa Barbæ.—Essen[1] gives the following as the result of the investigation of a case of trichorrhexis nodosa of the beard: 1. A small, well-characterized bacillus was found almost constantly in all the diseased hairs; 2. This bacillus differed essentially from that described by Hodara as the "bacillus multiformis trichorrhexidis," and has not yet been described; 3. Upon normal hairs and in 3 cases of trichorrhexis capillitii this bacillus was not found; 4. Inoculations practised with pure cultures of this bacillus upon normal hairs of the beard led to the development of a disease-picture identical with the original case; 5. Therefore it is in the highest degree probable that the bacillus in question can produce trichorrhexis nodosa, but the final proof will only be afforded when the vitality of the inoculated bacillus in the secondarily produced trichorrhexis has been demonstrated.

Treatment of Onychomycosis with Pyrogallic-acid Ointment.—This disease, as is well known, is extremely difficult to cure. Dubreuilh[2] has used Pellizari's method of treatment, which resulted in a complete cure in 5 cases. The nail and surrounding tissue are smeared twice daily with an ointment composed of equal parts of pyrogallic acid and olive oil. When the tis-

[1] Arch. f. Dermat. u. Syph., 1895, Bd. xxxiii. H. 3.

[2] Monatsh. f. prakt. Dermat., Bd. xxii., Feb., 1896.

sues around the nail have become acutely inflamed, the epidermis darkly discolored and raised up by pus, and the nail movable, the ointment is discontinued, the parts cleansed, the pus removed, and the ends of the fingers bandaged with antiseptic remedies twice daily. In a few days the blackened nail falls off spontaneously, and is in time replaced by a new nail.

Sabouraud[1] employs another mode of treatment for the same disease. Each finger is bandaged with absorbent cotton saturated with the following liquid: Iodin gr. 15; potassium iodid gr. 30; distilled water 1 quart. The bandage is maintained in position by a rubber finger-stall. After about 4 months of treatment the diseased part of the nails was observed to be divided from the healthy part by a transverse line, the growth of the cryptogam being arrested. The method is considered superior to evulsion and the production of an artificial paronychia.

THERAPEUTICS.

Diet in the Etiology and Treatment of Diseases of the Skin.— In a paper read before the British Medical Association, Walter G. Smith[2] presents the following conclusions upon this subject: (1) Very few skin diseases are directly traceable to dietetic causes, but improper diet may aggravate existing eruptions. Idiosyncrasy must be largely allowed for. (2) The diseases that may so arise are of a transitory character, and mostly belong to the class of erythemata. (3) Diet has very little influence in promoting the cure of cutaneous eruptions. The results are far behind popular expectations, even in such cases as acne rosacea, where we are led to hope for much. (4) Avoidance of alcohol, regulation of the bowels, and the cure of anemia are of infinitely greater importance than special dieting in the management of diseases of the skin. [In this country there are many able and experienced dermatologists who differ from Dr. Smith in his estimate of the value of a regulated or special diet in the treatment of many inflammatory diseases, especially eczema.] The same subject is also considered very fully by Brocq,[3] who from his investigations arrives at the conclusion that there is no exclusive diet for those with cutaneous diseases. It is only after having made a minute examination of the disease, then, of the idiosyncrasies of the patient, his constitution, his morbid tendencies, his mode of life, of his race, and the climate in which he lives, that one can prescribe his diet.

A New Lotion for Dry Itching Inflammatory Diseases.— Boeck[4] recommends the following formula: Talc and starch, of each 50; glycerol, 20; lead-water, 100. The bottle containing the mixture is to be well shaken; the lotion is diluted with twice the volume of water, and applied to the affected parts with a brush or mop, after which the region is left uncovered until the lotion has completely dried, leaving on the skin a thin coating of powder. A cooling, antipruriginous, astringent, and antiseptic action results.

[1] Ann. de Dermat. et de Syph., Jan., 1896. [2] Brit. Jour. of Dermat., Oct., 1895.
[3] Beit. z. Dermat. u. Syph., Festschr. Lewin., Berlin, 1896.
[4] Monatsh. f. prakt. Dermat., Bd. xxi. No. 3, Aug. 1, 1895.

In cases of very tender skin half of the lead-water in the above formula may be replaced by the same quantity of a 1 % boric-acid solution. The lotion is recommended in dry dermatoses, especially in acute papular eczema, chronic eczema, eczema of the genital and anal region, lichen, and psoriasis of inflammatory type. It is contraindicated in diseases accompanied by a fluid discharge.

Potassium Permanganate in the Local Treatment of Diseases of the Skin.—Bulkley[1] has found this drug, employed as a wash, 1 to 2 % strength, useful in a considerable number of cases of eczema, and also to some extent in other diseases characterized by itching. The solution is brushed or mopped over the surface and allowed to dry, which it does very quickly. The well-known brilliant pink or magenta-colored fluid turns very soon to a moderately dark brown, staining the skin for some little time, and is finally cast off by exfoliation of the tissues with which it has oxidized. It is most useful in subacute erythematous, papulo-squamous, and moist or weeping conditions. Immediate relief from the itching is usually experienced. It may be used 2 or 3 times daily. It is an oxidizing agent, and often serves to reduce thickening of the skin. To further protect the skin or to soften or lubricate the epidermis after the application, a zinc-oxid lotion or an indifferent ointment may in some cases be employed advantageously after the lotion.

A Nonirritating Ointment.—W. Allan Jamieson,[2] after alluding to the difficulty of finding a perfectly bland ointment for the treatment of diseases of the eyelids, states he has found one of Unna's cold-cream ointments, a little modified in proportions, to be an ideal ophthalmic salve. It is compounded as follows: Lanolin (Liebreich), ʒiij; ol. amygdalæ, aq. dest., *āā.* ʒss.—M. To this may be added with advantage 2 gr. of boric acid if the salve is intended to be kept for a long period. Patients express themselves pleased with the grateful sense of coolness, without smarting or irritation, which it imparts. [The formula is a good one, and the ointment is suitable for use either alone or as a base for various active drugs.]

Europhen as a Topical Remedy.—Saalfeld[3] recommends this remedy highly as the best substitute for iodoform. It possesses no disagreeable odor, does not irritate inflamed skin, and when mixed with water it constantly gives off small quantities of iodin. It is useful in varicose ulcers with eczema; in both hard and soft chancres; in pustular affections and folliculitis; and in many other dermatoses. It possesses, moreover, the power of arresting hemorrhage, and hence is useful in scarifications and in other minor operations upon the skin. [Eichhoff also has spoken in praise of this drug, which is one of the cresol-iodids, stating that it was the next best remedy to iodoform.]

Some of the Rarer Arsenical Preparations.—Danlos[4] has employed metalloid arsenic, the sulphid, and cacodylic acid. The first was prescribed in doses of 15–30 cgm. daily, suspended in honey. In psoriasis the effects of both metalloid arsenic and the sulphid were favorable, the eruption disappearing in due time without any unpleasant action of the drugs. Caco-

[1] Med. Rec., Feb. 29, 1896.
[2] Brit. Jour. of Dermat., Apr., 1896.
[3] Lewin's Festschr., Berlin, 1896.
[4] Ann. de Dermat. et de Syph., No. 6, 1896.

dylic acid was employed in daily doses of 25 cgm., was well tolerated, and produced the usual effects of arsenic. It is generally considered not to be toxic, and because of its solubility is easily absorbed.

Local Anesthesia in Dermatology.—Brocq[1] discusses the varied procedures employed in the numerous small operations of cutaneous surgery. Dubreuilh has reiterated his views on the advantages of cocain injected into the skin. Since the solution must infiltrate the tissues to be anesthetized in order to reach the nerve-terminations, the injection should be not subcutaneous, but intradermic, injected into the superficial denser layers of the derma, from which it is easily diffused into the lower and looser layers. He uses a 2 : 100 solution, and as a vehicle a mixture of equal parts of distilled water and cherry-laurel water, which keeps well. He never uses more than 4 cgm. of cocain, even in subjects previously anesthetized. After the needle has entered the skin several drops are injected, when the needle is pushed on parallel to the surface, say 5 or 10 mm., a little fluid being driven into the skin. When the injection is completed there is noted about the point of the needle a white area 10 or 15 mm. in diameter, which is due to compression of the vessels by the injected fluid, the zone corresponding exactly to the anesthetized area. In certain regions, as the tip of the nose, the nostrils, fingers, multiple punctures are required. When the skin is too thin for endermic injections subcutaneous punctures suffice.

Lucas-Championnière recommends as a harmless and certain local anesthetic, subcutaneous intradermic injection of guaiacol, which one of his pupils, Quidré, first employed. An oily solution containing 5 cgm. of guaiacol to the Pravaz syringe is used. Complete local anesthesia is obtained in from 5 to 10 minutes. The olive oil used as a vehicle must be pure or it may produce tiny scars at the edge of the puncture.

Inunctions with ointments and oils containing guaiacol or cocain produce only a hypothetic anesthesia, although after friction of the skin with pure guaiacol a certain degree of insensibility is obtained at the end of 10 or 15 minutes, which favors electrolytic operations. Some individuals are especially susceptible and bear such applications badly.

Brocq states for all electrolysis operations he now employs a mixture of chlormethyl and chlorid of ethyl, directed in a fine jet on the part to be operated on.

SYPHILIS.

Infantile Syphilis.—The series of the Hunterian lectures on infantile syphilis by Coutts[2] contains much of interest. The subject-matter may be presented in a condensed form, as follows: The influence of the father in infantile syphilis was illustrated by the lecturer's notes of 100 families in which the mother presented no signs of syphilis, and the disease in the

[1] Jour. of Cut. and Gen.-urin. Dis., Mar., 1896, p. 109.

[2] Brit. Med. Jour., Apr. 25, 1896.

infant was presumably derived from the father alone, and a similar number in which the mother was unmistakably syphilitic. In the first set of cases, in which the mother was apparently free from syphilis, there had been 563 pregnancies, resulting in 187 abortions, 193 children who died early, and 183 children still living. This gives the high mortality of 56.6%, but poverty and other factors are probably as much responsible for it as syphilis in such a district as the East End of London. But the mortality amongst affected infants does not gauge adequately the evils of syphilis in the offspring, for the death of the fetus *in utero* and the harm wrought by it in infants who survive must also be reckoned. As an instance of the long persistence of the father's influence the writer cites a case in which the fourteenth pregnancy, 16 years after the occurrence of syphilis, resulted in a tainted infant. Concerning the influence of the mother, Coutts believes that Fournier's estimate of the "index of harmfulness" where the mother was alone infected, which he had placed at 84%, is probably too high. From the lecturer's notes of 100 families where the mother was syphilitic, and in the vast majority the father also, the statistics give a mortality of 58%—a result not differing much from that obtaining when the father alone was affected.

The greater severity upon the fetus of a maternal syphilis over a paternal one is due probably to (the reason unusually assigned for it) the deleterious influence of the vitiated maternal fluids upon the fetus in utero, and the slight increase in the mixed parental type over the maternal one is possibly owing to a greater certainty and frequency of transmissions.

Considering next the symptoms of inherited syphilis, the writer dwells especially on the power of the disease to produce a condition of atrophy which might be the earlier symptom or might appear as late as the third or fourth month. In these infants there might be no other evidence of syphilis, either because no other symptoms had been produced or because the snuffles and rash had been too slight to attract attention. In such case there was atrophy of the secretive and absorptive surface of the intestinal tract and fatty liver, so that food was not assimilated. It was probably for this reason that mercury was of little use in syphilitic and infantile marasmus. In acquired syphilis in infants the chief peculiarities of the symptoms were the scantiness and evanescent nature of the eruption, which might be easily missed, and the subsequent early and luxuriant growth of condylomata. That inherited syphilis was occasionally contagious the writer believed, but he would equally contend that the virulence of such contagion had been grossly and vastly overestimated. Concerning infection in inherited syphilis, he would follow in the same path as Henoch, the only limitations he would place on suckling by mother or wet-nurse being the presence of excoriations on her nipples and ulcerations or fissures about the mouth of the infected infant.

Is Inherited Syphilis Contagious?—Parker's[1] 20 years' experience at a children's hospital in a populous district of London has afforded him a large experience with infantile syphilis, resulting in skepticism concerning so-

[1] Edinb. Med. Jour., June, 1896.

called "inherited syphilis." He observes that few things are more certain than that a large number of infants the offspring of syphilitic parents sooner or later manifest symptoms of a disease which is called "inherited syphilis." Few things are more curious than that lesions supposed to be typically syphilitic are found in children neither of whose parents show any traces of syphilis, and from whom, after careful inquiry, a history justifying syphilis cannot be obtained. On the other hand, a certain number of children one or both of whose parents are obviously syphilitic never at any time of their lives show the slightest sign of an inherited taint. These circumstances lead the writer to ask, Is not inherited syphilis largely a misnomer? Is all disease inherited by an infant from syphilitic parents really syphilis?—*i. e.* Is this disease specifically contagious? Does it breed true? After considering the views of many authorities, including the teaching of Colles, the writer puts forth his views, summarized as follows: 1. The children of syphilitic parents very frequently show manifestations of a disease which is almost universally called "inherited syphilis;" 2. In a large proportion of cases this "inherited disease" is not syphilis at all, in that the disease is noncontagious, and would be better named "inherited from syphilis;" 3. This inherited disease is true syphilis only if it conforms to the ordinary tests which pertain to contact syphilis, and proves to be contagious; 4. The children of syphilitic parents occasionally inherit syphilis; 5. The mother suckling a child with such a disease may be infected by it; 6. A healthy wet-nurse and other persons brought into contact with such a child are even more liable to be infected by it than the mother; 7. Lymph taken from such a child, even though apparently well at the time, would probably or possibly invaccinate syphilis; 8. In reply to the question, Can a healthy woman give birth to a syphilitic child? the answer must be *no;* 9. Many women give birth to children who suffer from what is called "inherited syphilis" without themselves appearing to be infected. The explanation is obvious: this "inherited syphilis" is not true syphilis in the true sense, and the mother's so-called "escape" depends upon this fact; 10. There is no recent clinical evidence which fully realizes Colles' teaching—namely, a mother suckling her own syphilitic infant and escaping an infection to which a healthy wet-nurse suckling the same infant and other members of her family, who have merely handled this infant, have succumbed, the latter facts being essential if only to establish the contagiousness of the infant's disease in any and every given case asserted to be "inherited syphilis."

Pathognomonic Clinical Symptoms of Congenital Syphilis.—Silex[1] has investigated this subject (especially from the standpoint of the ophthalmologist), and concludes that there are three symptoms which may be regarded as pathognomonic: 1. Choroiditis areolaris, as demonstrated by him; 2. Certain notched defects of the inner upper incisor teeth (which he purposely avoids designating "Hutchinson's teeth," for the reason that authors have described various conditions under this name); 3. The existence of peculiar linear or streaked scars, or more properly pseudoscars, occupying the face,

[1] Berl. klin. Woch., Feb. 24, 1896.

particularly the region of the mouth and the lips (as shown in a photograph). [The pseudoscars referred to occupy mainly the lower half of the face; are linear and varied in size; radiate from the mouth, extending over the upper lip, chin, and cheeks; and give a shrivelled, as in aged persons, drawn, somewhat contracted, sclerodermic appearance to the face. The origin or mode of formation of these peculiar atrophic lesions has not been satisfactorily explained, for they are not true scars, as the microscope has demonstrated, and hence the name pseudoscar is more appropriate. It is possible, as Silex suggests, that they are produced by a drawing-in of the skin by reason of permanent muscle-contraction or atrophy, similar to that in aged persons.]

Notes on Syphilis; Syphiloma of the Nose of Unusual Form and Evolution; the Diagnostic Value of Syphilitic Cicatrices; Extragenital Chancres and their Prognosis; Professional Syphilis.—Morrow[1] makes some interesting and valuable remarks upon the forms of syphilis indicated in the above title. A case of syphiloma of the nose and body is given (with photograph), in which large tumors sprang from the skin like mushrooms, and were strikingly suggestive of the tumors of granuloma fungoides, the growths being of doughy consistence, but not suppurative. The most interesting feature of this case, however, was the large tumor-like infiltration which occupied the upper lip, blocking the aperture of the left nostril, and mounting upward on the left ala to the bony and cartilaginous junction. So peculiar was this lesion in its form and consistence, and so refractory to specific treatment, that a suspicion of its representing a combination of syphilis and tuberculosis was entertained by several skilled observers who had examined the case.

Concerning the diagnostic value of **syphilitic cicatrices,** it may be said that syphilitic scars taken singly may be exactly imitated by the scar following a burn, a traumatism, or the ulcerous process of some other disease. But when they are multiple they exhibit certain specific peculiarities in their circular or serpiginous outline, their grouping, their pigmentation, their localization; they may be just as characteristic of syphilis as were the lesions in their full stage of activity. The cicatrices of varicose ulcers of the leg may imitate closely those of syphilis in this locality, but they are generally limited to the lower third of the leg, while those of syphilis most often occupy the middle and upper third. [An excellent photographic illustration of typical multiple scars of the lower extremities is given, such as would be of great value in the diagnosis of any obscure nervous or visceral complication in the future.]

During the past 3 years 20 cases of **extragenital chancres** were observed in the writer's public practice. In private practice 10 physicians sought advice for chancres of the hand or fingers contracted in the exercise of their professional work. Of the 20 cases seen in public practice, 3 were upon the upper lip, 5 on the lower, 3 on the chin, and the rest in various localities. One of the lesions on the chin was distinguished by its enormous dimensions, occupying nearly the entire surface of the chin. The surface was ulcerated,

[1] Jour. Cut. and Gen.-urin. Dis., Apr., 1896.

the edges elevated, hard, and everted, presenting the appearance of an ulcerated epithelioma. That diagnosis had been made by the patient's physician, and he had been sent to the New York Hospital to have the "cancer cut out." In another case the lesion over the knuckle of the right hand resulted from a blow which the patient administered to a drunken tramp. The skin was broken by the force of the blow, and a few weeks later the lesion appeared, followed by a characteristic eruption. In the 10 cases of professional syphilis the chancre occupied the terminal phalanx of the index finger in 5 instances. In none of the 8 cases of digital chancre was the lesion hypertrophic or fungating. In 1 case only was there an exception in the form of absence of epitrochlear and axillary adenopathy, not the slightest trace of glandular enlargement at any period being detected. Two of the cases were infected at the same time in performing a perineal section in a syphilitic patient: the operator, through a hang-nail on the little finger; his assistant, by an accidental prick on the wrist by the knife used in making the section.

The prognostic significance of extragenital chancres is considered. Chancres of the fingers, especially, are thought to portend a bad type of the disease. This conception, that the gravity of a constitutional infection may be modified by the seat of inoculation, receives support, it is thought, from analogy of other infectious diseases. Thus, for example, there has been observed a marked difference in the relative mortality of mad-dog bites according to the region in which the virus is implanted. The mortality of rabies is four times greater from wounds of the face and neck than from wounds of the lower extremities. Chancres on the fingers, especially of those of the panaris type, are proverbially painful and are apt to be attended with severe glandular complications. Mauriac thinks that the bad reputation which chancres of the fingers possess is merited, and states that authorities are generally united on this point.

Professional Syphilis.—Medical men cannot be too strongly impressed with a recognition of the risks incurred, for professional syphilis is much more common than is generally supposed. The disease once acquired, the risk to others is great. A digital chancre involves serious danger to those with whom its bearer comes into professional relation. These facts suggest an ethical question of great practical importance—namely, whether a physician is justified in continuing his professional work while he bears on his hands such an active source of contagion. So far as the obstetrician is concerned, there can be no doubt as to his manifest obligation to abandon his work until the chancre is healed. One physician's case is cited who attended to a large obstetrical practice for several weeks after the existence of the chancre. It is just to say, however, that he had no suspicion of the syphilitic nature of the sore until the eruption appeared. The importance of an early diagnosis of the digital chancre cannot be overestimated. Almost all patients maintain that it must be a simple sore, a felon, a septic infection, or something else, and they cherish this delusion until their perceptions are quickened by the appearance of unmistakable constitutional symptoms. One of the writer's patients,

acting on the advice of his confrères, and believing that his chancre was an infected wound, had it scraped and cauterized, and the entire chain of glands, including the axillary, extirpated. The procedure delayed somewhat, but did not prevent, the evolution of the disease. [The notes of the cases presented, the information and sound teaching conveyed to the reader in this valuable article, are so instructive that a résumé has been given.]

Syphilis and Lardaceous Disease.—Weber[1] in his article on this subject endeavors to show how lardaceous formation in the tissues, when occurring in association with active tertiary syphilitic manifestations, and especially the lardaceous formation occurring in the immediate neighborhood of gummata, may be taken as additional evidence of the already probable view that active tertiary syphilitic manifestations are caused by the presence of a specific microbe at the site of the lesion. The conclusions which appear most probable may, he believes, be summed up thus: 1. There is a specific microbe of syphilis the local presence of which is the cause of the tertiary lesions of syphilis; 2. The metabolic products of this microbe have, like those of some other microbes, such as the staphylococcus pyogenes aureus and the bacillus pyocyaneus, the peculiar property of producing lardaceous formation in the tissues of the host.

Antagonism between Tuberculosis and Syphilis.—Abrahams[2] reports the notes of a case occurring in a Pole of 35, in which there existed positive clinical and pathological symptoms of tuberculosis pulmonalis, including the presence of tubercle-bacilli in the sputa in abundance. Under the use of creasote, ultimately in dram-doses thrice daily, the several symptoms improved considerably, and the patient disappeared from observation for 10 weeks, when he again sought treatment, on this occasion not for the tuberculosis, but for acute syphilis in the form of a chancre and the usual systemic symptoms of syphilis in the early period. Eight weeks later he was seen again; he had lost strength and was rapidly losing ground; had a cough and elevated temperature and pulse. Under cod-liver oil, the use of 50 mercurial inunctions, and the occasional use of sodium iodid not only did all the syphilitic symptoms vanish, but what was very remarkable was that positively all symptoms of tuberculosis, one by one, disappeared. Treatment for syphilis with iodid was occasionally resorted to. He has since enjoyed health.

Toxin-theory of Syphilis.—In an earlier paper, published in the Lancet in 1892, on the Pathology of Syphilis, Ward[3] advanced a working hypothesis deduced from a consideration of the phenomena of the hereditary disease, which he has recently applied to the question of latency of syphilis.[4] In order to cover the vast array of facts involved, it is evident that such an hypothesis must be of elemental simplicity; reduced to its lowest terms, it may be stated thus: 1. Syphilis is associated with the growth of a microbe in the organism; 2. This microbe produces a toxin which is the active cause of the phenomena of syphilis. In the light of modern bacteriology this theory seems

[1] Am. Jour. Med. Sci., Nov., 1895.
[2] Med. Rec., Dec. 28, 1895.
[3] Lancet, May 16, 1896.
[4] Lancet, 1896.

almost self-evident; however, until the specific microbe has been discovered, cultivated, and inoculated, and the toxin isolated, it must remain an hypothesis. The writer endeavors to show, however, that it is one that will work. The toxin must be supposed to share the properties of other microbial toxins; thus, it is diffusible and follows the laws of osmosis; it is irritating to the tissues and causes local inflammatory reaction; it is strongly chemotaxic and attracts leukocytes into the area in which it is present, and when existing in quantity in the circulation it causes symptoms of general toxemia. [The hypothesis is interesting and is approached by the writer from a scientific aspect; it is substantiated by many observations which he brings forward, and must be regarded as a valuable contribution to a theory about which we are likely to hear more in the near future.]

Experiments in Serotherapy for Syphilis.—Baget's[1] article on this subject goes to show that Tommasoli of Palermo was the first to experiment in syphilis with serum, and that he was induced to do so on the ground that, inasmuch as all attempts to inoculate lower animals with syphilitic virus had failed, it was allowable to suppose that in the blood of these animals there exists a chemic substance which renders them refractory, either preventing inoculation or rendering the reproduction of the virus impossible, and by inoculating man with the serum drawn from the blood of these animals a special resistance to the syphilitic virus is obtained. Pellizari took another and different view of the subject—in brief, that the products secreted by the syphilitic microbe have an antagonistic action upon the microbe itself, and hence that the introduction into the organism of the syphilitic subject of serum taken from another syphilitic, or "syphilitoxin," might prove beneficial or curative. In Tommasoli's experiments serum was taken from the lamb, dog, or rabbit, injected under the skin of the buttocks in doses of from 2 to 8 c.c. at certain intervals, and with gratifying results. Other investigators report negative results. Pellizari used the serum in doses of from 0.5 to 1 c.c. every third day or daily. Improvement followed these experiments. Mazza modified Pellizari's method, and employed serum taken from an animal that had been inoculated with the blood of a syphilitic subject.

Gilbert and Fournier[2] summarize the work done in this direction by Feulard, Tommasoli, Mazza, Kollman, Fournier, and Pellizari, and conclude that, while some cases showed marked improvement under the serum-therapy, others were uninfluenced by it.

Viervioroysky[3] reports 5 cases of secondary syphilis treated with subcutaneous injections of blood-serum derived from the blood of robust individuals affected with tertiary syphilis, the serum being filtered through a Chamberland filter and 0.5% of phenol added to it. From 4 to 20 c.c. (1 to 5 f3), usually 10 c.c. ($2\frac{1}{2}$ f3), were employed for each injection, the total number for each patient being about 20. The injections were made below the angle of the scapula. The patient rapidly improved; relapses occurred, but yielded

[1] Jour. des Mal. cut. et syph., 1895, vii. p. 155. [2] Brit. Med. Jour., June 1, 1895.
[3] La Sem. méd., 1895, xv. p. 186.

rapidly to renewed injections, the mucous lesions being the slowest to disappear.

Héricourt and Richet[1] also report favorable results in a case of tertiary syphilis with ulcerating gummata of the leg, in which general and local mercurial treatment had been used without benefit for 3½ months. The serum employed was taken from an ass into whom had been injected 20 cm. of blood taken from a subject in the secondary stage of syphilis, the blood-injection antedating the serum-injection 54 days. Cure was established in 4 weeks.

A. S. Barling[2] gives a case of phagedenic chancre with marked erythematous syphilis of the skin, the ulceration being so rapid and deep as to threaten loss of the penis, in spite of the internal use of mercury and the most approved and heroic local treatment; 10 c.cm. of an "antisyphilitic serum" were injected into the flank during a period of 4 days (instead of 7, as usual), the urgency of the symptoms seeming to warrant this course. The treatment had "a very good effect." There was distinct redness and increased swelling around the chancre on the second day.

Treatment of Syphilis by Injections of Syphilitic Antitoxin.—Edward Cotterell[3] has employed the serum of an individual who has passed through an attack of syphilis, and who has thus been rendered immune to subsequent attacks of this disease; 18 cases were treated by this method with the following results: 1. In the early stages of syphilis, when there is only a sore and glandular enlargement, injections of this serum cause the sore to heal rapidly, but the adenitis in the groin generally becomes intensely marked. The skin- and throat-symptoms are only slightly marked or absent; 2. When the case is not treated until the cutaneous and mucous symptoms have developed the eruption fades rapidly, more so, as a rule, than under mercurial treatment, but the throat-symptoms disappear rather slowly; 3. The general health improves; 4. The serum from an individual with well-defined secondary syphilis appears to be more acute than that obtained from a subject in the tertiary period. The dose of the serum injected was from ½ to 5 c.cm. [Further experiments are required to establish the value of this mode of treatment. As has been shown, some cases have been favorably influenced by the treatment, while in others the results have not been striking or have been negative. The source of the serum and antitoxin, especially the latter, are important points to be kept in mind in estimating the results. The abstractor believes that we shall soon hear much more of this theory in syphilis.]

A Case of Ulcerating Syphilis Cured by Feeding with Thyroid Gland.—Gouladse[4] records the good effects of feeding with fresh thyroid gland with salt, butter, and bread in severe ulcerative syphilis in a woman aged 25. From the fifth day on marked improvement was noted; the patient gained in weight, and the ulcer was soon completely cicatricized. The dose of 300 grains a day was gradually increased, 30 grains at a time, until 200

[1] Bull. méd., 1895, ix. p. 342.
[2] Brit. Med. Jour., Feb. 8, 1896.
[3] Med. Press and Circ., Aug. 28, 1895.
[4] Méd. mod., Oct. 5, 1895.

grains were taken 4 times a day. Every third day the treatment was intermitted for 24 hours. At the end of 5 months the patient was considered to be cured.

The Therapeutic Value of Erysipelas in Syphilis.—Rudolph[1] records 2 cases in which accidental erysipelas exerted a remarkably favorable influence over the course of syphilis. The syphilitic symptoms in both cases disappeared much more rapidly than would have been possible under the most judicious and active local and internal treatment. In 1 case the syphilis was of 19 years' duration, and there existed two syphilitic ulcers; in the other the date of infection was 4 years before cerebral symptoms, a severe cachexia, glandular enlargement, and joint-disease were present. [Experience has shown that while attacks of erysipelas usually exert a benign influence upon the existing symptoms of syphilis, often causing them to disappear rapidly, the introduction into the system of the erysipelas-virus cannot be regarded as permanently curative, inasmuch as relapses sooner or later generally occur.]

Treatment of Syphilis by Hypodermic Injections of Mercury.—Martin and Kiersted[2] report 9 cases treated by this method, from which they conclude that the disease treated by either soluble or insoluble preparations of mercury is not more efficient than other and commoner modes of administering the drug, and that it gives rise to so much pain that it is impracticable. The latter may be slight and transitory or almost unbearable, and may incapacitate the subject for work for days at a time. There is no certain way of preventing it, and it may suddenly manifest itself in those who have taken many previous hypodermic injections without complaining of it. Abscesses may certainly be avoided by the simplest antiseptic precautions. Before beginning the injections it should be ascertained that the kidneys are not diseased, since practically all fatal cases of salivation (and there have been many in this treatment) have occurred in subjects with diseases of the kidneys. When insoluble preparations are employed the site of injection should be particularly selected, so that in case of symptoms of salivation an incision may immediately be made through the seat of such injection and any unabsorbed mercury removed. When an immediate mercuric impression is desired hypodermic medication should be selected, supplemented by inunctions.

The Local Changes produced by Intramuscular Injections of Insoluble Mercurials.—Wolters[3] made an autopsy upon a woman who died of tuberculosis of the lungs. She was syphilitic, and during life had received 62 intramuscular injections of salicylate of mercury. She died 2 years after the last injection had been made, at which date hard lumps in the glutei muscles which followed the injections still remained. The gluteus maximus showed a number of spindle-shaped injections above the muscular tissue, and was joined to the gluteus medius by these projections. Under the microscope the muscular fibers were noted to be diminished and the septa of connective tissue enlarged, so much so that in the center of the growth the

[1] Centralbl. f. innere Med., No. 5, 1896. [2] Phila. Polyclinic, Jan. 4, 1896.
[3] Arch. f. Dermat. u. Syph., Bd. xxxii. H. 1 u. 2.

muscular fibers were surrounded by connective tissue. Neither mercury nor bacteria were found, but "mastzellen" were noted scattered around the fibers. The muscle was atrophied and showed fatty degeneration. The author concludes that the mercury acted as a positive irritant upon the connective tissue, giving rise to proliferation, especially in the muscular septa, and to the new formation of vessels, and the transformation of the muscles into soft masses.

On the Action and the Application of Intravenous Sublimate Injections as Recommended by Bacelli.—M. Dinkler,[1] assistant to Prof. Erb, concludes from his experience that the treatment of syphilis by the intravenous injections of sublimate, rational as it seems, cannot be recommended to take the place of established methods, such as inunction and the subcutaneous injections of mercurials. The method is not without technical difficulties, and on account of deficient development of the veins of the skin in very many patients is at once excluded. Thrombi also frequently are formed. On the other hand, on account of the quick action, the method is to be recommended in the rapidly-spreading forms of cutaneous and mucous syphilis, as well as in all difficult cases of syphilis of the central nervous system. [The author, while admitting that this method possesses certain advantages for some cases, does not endorse it; on the contrary, one concludes, after reading the article, that the obstacles to its successful practice are such that it cannot be recommended for ordinary cases. References are made to the experiments of Blaschko, Neumann, Lang, and Kaposi in the same field.]

The Iodids, other than Potassium Iodid, in Syphilis.—Briquet[2] discusses the literature of this subject, and cites several personal observations, his conclusions being that—1. All the iodids have clearly antisyphilitic properties; 2. The potassium iodid is, in a general way, the most active, but rubidium iodid, often better tolerated, appears to the writer to be almost its equal; 3. When potassium iodid is not tolerated one should not hesitate to have recourse to the sodium iodid, which succeeds very often; 4. Strontium iodid possesses no advantage, and it is well to avoid it against syphilitic cephalalgias; 5. Ammonium iodid should be reserved for certain cases of grave syphilis in which the potassium salt fails or appears to be inactive; it seems to be especially useful against tertiary eruptions; 6. Lithium and calcium iodids are slower and less positively active than the preceding iodids; 7. To obtain an effect about equal, or at least comparable, to that which the potassium iodid gives, it is necessary to prescribe the other iodids in like doses.

CHANCROID AND CHANCRE.

The Germ of Chancroid.—Lydston[3] takes up the question of the specificity of chancroid from the period of Bassereau, who demonstrated the duality of chancre and chancroid. Many researches have shown that the poisonous properties of chancroidal secretion are similar to those of other septic fluids. Pasteur, Koch, Lestikow, Morrison, and Mannio have all made

[1] Berl. klin. Woch., May 13 and 20, 1895. [2] Jour. des Mal. cut. et syph., Fév., 1896.
[3] Internat. Med. Mag., Dec., 1895.

this observation, and thus have confirmed a view which is supported by clinical experience. The first accurate work on the germ of chancroid was done by Ducrey of Naples in 1889. He described what he considered to be the pathogenic bacillus of chancroid, and showed that it was always associated with divers other microbes, and finally presented evidence which tended to show the specificity of the germ which he had discovered. Wehling and Krefting 3 years afterward confirmed his observations, but Jullien obtained only negative results. In 1892, Unna claimed to have discovered in sections of the tissues in the neighborhood of a chancroid a bacillus which he believed to be different from that described by Ducrey, but Nicolle, Columbini, and others afterward showed the identity of the two. Columbini's researches in particular go to show that a special form of bacillus is to be found in chancroid and its attendant bubo, and that it is neither susceptible of cultivation nor of inoculation on the lower animals. As Lydston observes, the latter point militates somewhat against the specificity of the germ. In a comprehensive article Le Damany describes the Ducrey bacillus, as found in the pus of simple chancres, as follows: The bacillus, when viewed singly, is short, ordinarily thick, with rounded extremities, having in the center a clear space. It is frequently grouped in masses or short chains, the latter being sometimes fasciculated. It is not uniformly disseminated throughout chancroidal pus, some preparations, according to Le Damany, containing a very large number of germs, while in others very few can be detected. They are found both within and without the pus-corpuscles. Lydston is of opinion that, however strongly the claims of the Ducrey bacillus may be presented, a survey of the varied and manifold kinds of germs found in chancroidal pus in intimate association with the alleged specific bacillus bears abundant testimony to the decidedly mixed character of the infection. The most important evidence of the specificity of the Ducrey pathogenic organism is the fact that numerous and competent observers have failed repeatedly to find the germ in anything but chancroid. The chain of evidence will be incomplete until pure cultures can be made outside of the tissues. The author of the paper is not yet prepared to accept the specificity of the Ducrey bacillus as absolutely proven, though he has faith in the results thus far recorded. He agrees with the view of Ducrey, that chancroid, as it presents itself clinically, is a decidedly mixed infection, and hence is surrounded with difficulties in its pathology.

Pseudochancre.—Gottheil[1] calls attention to the rarity of syphilitic reinfection. Literature gives many recorded cases, but a careful analysis shows that the vast majority of them are open to grave doubt. In many cases of reported reinfection sclerosis is the only symptom that is noted, the other manifestations of a secondary nature being either mild or ill defined. Sigmund long ago pointed out that there occurred tertiary ulcerations that possessed all the characteristics of the true sclerosis, and Fournier has classified several lesions which simulate the initial chancre. Bregeal called attention to gumma of the penis, the frequency of its occurrence rendering it

[1] N. Y. Med. Jour., Sept. 28, 1895.

extremely liable to be mistaken for a primary lesion. Von Düring has observed pseudochancres in which an apparently characteristic induration lasted for from 5 to 6 weeks, and which were never followed by secondary symptoms. Keyes believes that in most of the recorded cases of a second attack of syphilis a pseudochancre was mistaken for a true sclerosis, and Taylor has expressed a similar opinion.

Nevertheless, there are a few undoubted cases on record. According to the author of this paper, a true chancre may be simulated by—1. An artificial induration, such as may be produced under an herpetic or chancroidal ulceration by the use of nitrate of silver, carbolic, nitric, or acetic acid and the like; 2. A nodular lymphangitis in gonorrhea; 3. Scabies; 4. A secondary induration occurring late in the disease at the site of the initial lesion, constituting the pseudochancre of Fournier; 5. A syphilitic papule or tubercle; 6. An ulcerating gumma; 7. An epithelioma. Several interesting cases are recorded that had been erroneously regarded as primary chancre by competent observers.

Syphilitic Chancres of the Urethra.—Baum[1] reports 4 cases of urethral chancre, the diagnosis having been established by other later symptoms of syphilis. The chief point of interest in the cases is that in all of them the disease had been regarded by other physicians as gonorrhea. The author is of opinion that one should not make a diagnosis of gonorrhea in cases of urethral discharge without an examination, for gonorrheal infection and chancre of the urethra may be coincident, or the latter may occur without gonorrhea.

Phenol in the Local Treatment of Chancroid.—Neisser[2] advocates the cauterization of soft sores with phenol, for the reason that it possesses the advantage of not provoking inflammatory induration, as does silver nitrate, and consequently does not obscure the diagnosis. As a rule, one application suffices, and no further treatment than that commonly employed for a simple ulcer is required.

[1] N. Am. Pract., Dec., 1895.

[2] London Pract., Mar., 1896.

MATERIA MEDICA EXPERIMENTAL THERAPEUTICS AND PHARMACOLOGY.

By HENRY A. GRIFFIN, M. D., AND COLMAN W. CUTLER, M. D.
OF NEW YORK.

The progress of the past year has been most marked in two directions—the development of the therapeutic uses of the animal extracts and the production of synthetic compounds. In the case of the animal extracts Oliver and Shafer's experimental work has borne practical results in the treatment of Addison's disease and asthenic conditions of the vasomotor system by the medulla of the suprarenal capsules. This opens a large field of possible usefulness, and seems to establish the claims of organotherapy on a firm basis. Baumann appears to have isolated the active principle of the thyroid gland, which is a very important step toward scientific precision, and foreshadows the same achievement in the case of the suprarenal bodies and possibly the bone-marrow. Wood hints at an association between the spleen and the thyroid, and seems to believe that a splenic extract may be of use in exophthalmic goiter. It is unwise to be sanguine, however, over the indiscriminate uses of glandular extracts. What success has been attained is the legitimate and logical sequence of experiment and scientific induction, and empiricism will endanger, or at least delay, the best results. Our knowledge of nucleins has increased, but only from a physiologic point of view; their therapeutic uses are still unknown. Chittenden's paper summarizes the present status from the side of physiologic chemistry. It is possible that further research in this direction may throw important light on the mystery of uric acid.

With regard to the synthetic drugs which are constantly evolved from the German laboratories and manufactories of chemicals, it must be said that the physician is in danger of accepting the assurance of the chemist with too great confidence. A more thorough knowledge of organic chemistry would enable us to judge more clearly, or at least to see what a narrow line separates the harmless from the dangerous compounds. Numerous instances of poisoning by some of the most familiar of these drugs have been noted this year, and it will certainly not be amiss to caution the profession against their indiscriminate use. Too little is known of their mode of action on the human organism, and, it may be added, too little is known of the latent possibilities of the individual to justify any but a cautious and watchful use of these new remedies. The synthetic remedies are, for the most part, hypnotics, antipyret-

ics, or antiseptics, and if used to excess are either depressant or directly harmful to the heart or blood. An exception is guaiacol, as to which there has been but little reaction from the high favor in which it was held last year; its production synthetically will establish its purity and increase its usefulness.

It would seem that the oil of sesamum, a pure oil containing no free fatty acid, may be substituted for cod-liver oil; as it is readily absorbed, and in many cases much better tolerated, it should be more useful as a food.

It was to be expected that Bunge's views of the absorption of iron would be contested, and it is a relief to find that his hypothesis is not tenable.

All references to the advances made in serum-therapy have been avoided, as the subject will be treated in full in other departments of the *Year-Book*.

Acetanilid, Poisoning from the External Use of.—Newton[1] tells of a child with extensive burns of face, arm, and leg. The central portions of the wounds were sprinkled with acetanilid. Between 20 and 40 gr. were used on 5 occasions in 9 days. When this dressing was applied on 2 successive days there followed in 4 hours a condition approaching collapse, and marked by extreme cyanosis, weak and rapid pulse, and dilated pupils. Recovery was gradual, the cyanosis and cold extremities lasting several hours. The next morning the patient was as well as usual. As the symptoms were not attributed to the acetanilid, the dressings were continued, and the same condition was repeated. [This case is of interest because, as the author well says, in using the coal-tar products externally we are not free from the dangers which attend their internal exhibition. They are remedies whose powers, limitations, and dangers are not yet understood, and many statements regarding them have proved misleading in practice.]

Frollington and Pratt[2] assert that there is no danger of poisoning from absorption of acetanilid externally applied. [Such a statement is certainly not justifiable regarding agents of whose physiologic action we have so little knowledge as of the coal-tar products.] Two similar cases of poisoning are reported by Rook.[3] In one case, an infant of 4 days, the poisoning resulted fatally, the child becoming deeply cyanotic and dying in a few hours.

Carmalt[4] relates a similar experience which, however, did not result fatally.

Acetanilid, according to Munger,[5] may be used for insufflation on nasal wounds after operations. The pure powder proved a better dressing than when mixed with zinc stearate. The healing seemed more rapid, frontal headache and neuralgic pains following operations seemed less frequent, and no cyanosis, profuse sweating, cardiac depression, or unfavorable systemic effects were observed. Persistent hemorrhages were apt to follow the use of the drug upon septal wounds.

Alkaloidal Tinctures, Strength of.—In the report made at the annual meeting of the British Pharmaceutical Congress[6] it was shown that there was a very wide range in the alkaloidal value of the commercial samples of the

[1] N. Y. Med. Rec., Mar. 7, 1896.
[2] Am. Jour. Med., Sci., Aug., 1895.
[3] Jour. Am. Med. Assoc., 1896, xxvi. p. 239.
[4] Yale Med. Jour., 1896, p. 131.
[5] Am. Med.-Surg. Bull., May 16, 1896.
[6] Therap. Gaz., Nov. 15, 1895.

tinctures of the British Pharmacopœia. Some of the tinctures were 2 or 3 times the strength of others, even in the case of such tinctures as those of opium and cinchona, which are directed to be made from standardized drugs, while in the case of the tincture of nux vomica one of the samples was found to be about $\frac{2}{3}$ as strong as it should be, and several others were deficient in alkaloid. The tinctures of conium were, as a rule, worthless. Attention was drawn to the fact that the relative proportions of alkaloid and extractive contained in different samples of the same drug varied between very wide limits. The investigation showed that poor results might be expected when only standardized crude drugs were used, and that reliance should be placed in doubtful cases only on an assay of the finished product. The writer, Mr. Christie, says every liquid representing a drug containing a powerful active principle should be subjected to careful assay, the strength being stated on the label, and a distinctive name applied to such preparations as a class which would indicate the nature or aim of the class of preparation, as, for instance, "normal liquids."

Amygdalate of Antipyrin.—This preparation is named tussolo in Italy, where it has been recommended in the treatment of whooping cough.[1] The dose for infants is said to be from $\frac{3}{4}$ to $1\frac{1}{2}$ gr. several times a day.

Anarcotin.—Roberts[2] discusses a neglected alkaloid of opium which came to his attention during his travels in India as a member of the Royal Commission on Opium. By far the most abundant alkaloids of opium are morphin and anarcotin, the latter representing the antimalarial properties of the drug. Numerous experiments and an experience dating back 56 years in India show that anarcotin is scarcely inferior, and in some classes of cases is superior, to quinin as an antiperiodic. It is recognized that certain cases of malarial fever which resist quinin yield to anarcotin, while in a certain percentage of cases it proves wholly ineffectual. The alkaloid was originally named narcotin by its discoverer, Derosne, but as it is, in a pure state, entirely devoid of narcotic qualities, it has been renamed, by Dr. Palmer, anarcotin. A summary of Dr. Palmer's experiments in 1857–59 is as follows: 546 cases of malarial fever were treated with anarcotin in doses ranging from 1 to 3 gr. Of these, 541 were cured and 5 died. In general, he says, in 70% the fever was arrested at the second paroxysm after the drug was administered; in 20% the arrest was equally sure, but not quite so quick; and in 10% the medicine did not appear to have any effect. The drug is stated to be perfectly insoluble and tasteless. Small doses produce no effect; 1 g. caused vomiting in 3 out of 4 dogs, 0.5 g. in 1 out of 2. When added to the food in doses of 0.3 to 0.5 g. it had no effect on temperature, respiration, or pulse. There was a slight increase in the water in the stools and in nitrogen unabsorbed. This led to a loss of weight, which was immediately regained on stopping the drug. Anarcotin chlorid (made by dissolving anarcotin in dilute HCl, drying, and redissolving the chlorid in chloroform; the addition of ether causes precipitation of crystals of anarcotin chlorid) is very soluble, with an intensely bitter taste; 1 g. in 3 dogs caused no vomiting, and with 0.3 to 0.5 g. sub

[1] Univ. Med. Mag., Sept., 1895.

[2] Brit. Med. Jour., Aug. 17, 1895.

cutaneously there was no alteration in blood-pressure, pulse, respiration, or temperature.

The **anhalonium Lewinii** is a plant of the cactus order growing in the valley of the Rio Grande in Mexico. The dried tops constitute the mescal buttons which are used by the Kiowa Indians in their religious ceremonies. This plant has been studied by Lewin and Heffter, and more recently by Prentiss and Morgan,[1] who have added much to our knowledge of its nature. The mescal buttons are brown, circular, 1 to $1\frac{1}{2}$ in. in diameter and $\frac{1}{4}$ in. in thickness. They are brittle, swelling, however, in the mouth and becoming soft. The taste is very bitter and nauseous, with a persistent after-taste. A marked sensation of stinging or tingling is produced in the fauces. The powdered button is odorless when dry, but acquires a nauseous odor when moistened. An alkaloidal substance, syrupy in consistence and having an intensely alkaline reaction, was obtained by Lewin in 1888. This has been separated by Heffter into 3 alkaloids: the first forms brilliant, colorless, needle-shaped crystals; to this was given the name anhalonin, $C_{12}H_{15}NO_3$. The second formed non-lustrous, white rhombic tablets. The third was an amorphous and very poisonous alkaloid left behind in the mother liquid. Besides these there are at least two resinous bodies, as well as a wax-like substance. Investigations now being made will probably throw more light on the subject. The conclusions of the authors as to the physiologic action, drawn from 6 experiments, may be summarized as follows: The production of visions ranging from ill-defined flashes of color to most beautiful figures, forms, landscapes, the vividness of the colors being most striking. The conclusion is that this effect is due to a stimulation of the centers of vision in the brain. In one case there was a persistent ache and sense of exhaustion in the occipital region, lasting for several days after the drug had been taken. Dilatation of the pupils was marked in every case, and persisted for from 12 to 24 hours after the drug had been taken; there was also a slight loss of the power of accommodation. More or less muscular depression was present in every case, this being the first effect noticed: the authors are of the opinion that this is due to the central action, and not to a direct influence on the muscles. Partial anesthesia of the skin was present in 3 cases. The heart-action was a little slower and weaker at first, but soon regained the normal. There was inability to sleep for at least 12 hours after the effects of the drug began to pass off. A similar experiment made by Briggs[2] gave different results, the pulse rising suddenly to 160, and the respiration becoming so rapid that there was great distress; this was followed by unconsciousness; in 6 or 8 hours the condition again became normal. [It seems probable that the drug taken by Briggs was not identical with that at present under examination. The anhalonium Lewinii resembles cannabis indica in producing visions, but the latter is hypnotic. There seems to be little similarity between this and any known drug. In the tendency to produce wakefulness and the dilatation of the pupils the effects suggest the action

[1] Therap. Gaz., Sept. 16, 1895.

[2] Lewin, Arch. f. exper. Pathol. u. Pharm., Bd. xxxiv. H. 5 u. 6.

of cocain. The visions of cannabis indica are generally of a gay character, producing much merriment, accompanied by a great inclination to muscular movement.[1] The visions from anhalonium Lewinii, on the other hand, provoked wonder and admiration, but no merriment, and there was present a disinclination to make any muscular effort.]

In a later communication[2] the authors give certain indications for the therapeutic use of the drug. They say: The extreme effects mentioned—such as the production of visions, partial anesthesia of the skin, loss of sense of time—are the effects of an intoxicating dose. They would not appear under ordinary circumstances in the administration of the drug in proper therapeutic doses. Judging from the physiologic action, then, and from cases which have already been reported,[3] the authors conclude that the mescal buttons may be of use in the following conditions: general nervousness, nervous headache and cough, abdominal pain due to colic; as an antispasmodic in hysterical conditions; as a cerebral stimulant in melancholia and allied conditions; as a substitute for opium and chloral in some cases of mania and acute delirium and in insomnia caused by pain. The following preparations may be used: tincture anhalonii (10%), dose 1 to 2 teaspoonfuls; extractum anhalonii fluidum (100%), dose 10 to 15 drops; pulvis anhalonii, dose 7 to 15 gr.: anhalonin: Experiments are now in progress to determine the identity, physiologic action, and dose of this alkaloid.

Animal Extracts.—Prof. Wood[4] in a clear and scholarly manner summarizes our present knowledge of the physiologic action and therapeutic use of these substances. The use of thyroid extract in myxedema rests on a firm scientific foundation. It has been tried empirically in many diseases. "In hypertrophy of cicatricial tissue resembling keloid, possibly true keloid, thyroid extract has caused absorption of the hypertrophied and cicatricial tissue. It has been used with success in simple goiter; in the goiter of Switzerland, before calcareous degeneration has taken place, it will bring about destruction and absorption of the overgrown tissue. In excessive obesity with tendency to weakness and anemia, in which exercise and diet fail, thyroid extract should be tried. It is sometimes useful in melancholia, but how it acts we do not know. When thyroid extract is used freely in continuing doses, it sometimes produces a series of phenomena constituting so-called thyroidism. The most important of the symptoms are loss of weight, shortness of breath, and a weak and rapid pulse. In all cases in which the extract is being used freely and continuously, but especially in those cases in which the symptoms are not those of myxedema, the patient should be weighed at least every 2 weeks, and any undue loss of weight or disturbance of circulation or respiration should be the immediate signal for the withdrawal of the remedy or a great reduction of the dose. The thyroid extract has been largely used in exophthalmic goiter, but here, I am sure, it does harm. The cause of the symptoms in exophthalmic goiter is undoubtedly the excessive development of the thyroid secretion."

[1] Brunton, Materia Medica, etc., p. 1026.
[2] Therap. Gaz., Jan. 15, 1896.
[3] Ibid.
[4] Univ. Med. Mag., Apr., 1896

Thyreoiodin.—Baumann[1] claims to have isolated the active principle of the thyroid gland. It is an organic compound containing a large proportion of iodin and ½% of phosphorus. The author obtains thyreoiodin in the following manner: The thyroid gland is hashed and boiled for several days with a 10% solution of sulphuric acid, whereby a fine, flaky precipitate is formed, which is separated and repeatedly boiled with 85% alcohol. The residue obtained on evaporating the alcoholic liquor is dissolved in soda solution, the solution thus obtained filtered and treated with diluted sulphuric acid, when thyreoiodin separates as a brown, amorphous substance. Experiments conducted by Dr. Roos are said to show that this new body has the same effect on the human organism as the thyroid gland itself. Several substances have been obtained by different investigators from the thyroid gland; thyreoproteid, thyreoantitoxin, and thyreoidin have been supposed to embody the active principle, but they have not found favor. From another source[2] we learn of thyroiodin, which may be identical with the thyreoiodin already mentioned, although the description varies somewhat from that given above.

Thyroiodin is said to be a white powder of the same specific gravity as sugar of milk; 1 g. represents 1 g. of fresh gland and contains 0.3 mgm. of iodin. The dose for adults is 0.3 g. 1 to 3 times daily. Maximum dose 2½ g. daily. The method of its production and its source are not given.

According to Hutchinson,[3] the thyreoantitoxin of Fränkel and the body isolated by Drechsel are crystalline, proteid, free, and clinically inert. Hutchinson found that the proteids of the thyroid are practically 2 in number—a nucleoalbumin, which is inactive, and a colloid matter, which he believes to be the active principle of the thyroid. In this substance Hutchinson found a considerable quantity of iodin in organic combination, which seemed identical to that found by Baumann. Ewald[4] discusses Baumann's thyreoiodin, and states that its discovery is a very important step in therapeutic progress. By this means, says the author, the long-desired precision of dosage and the purity of the active substance are obtained. According to the investigations of Roos, Treupel, and Ewald,[5] thyreoiodin contains the specific constituents of the thyroid in toto, and may therefore be substituted for the fresh gland or for the extracts and dry preparations.

With regard to the action of the thyroid preparations, two components must be distinguished—one which includes the visible results, the second which produces certain subjective symptoms, which may be mere discomfort or outspoken disorder; these have been called thyreoidismus. Metabolism may be increased, and this may produce changes in the general condition, such as general weakness, anorexia, nausea, thirst, sleeplessness, vertigo, pains in the back, palpitation, and pseudoangina pectoris. These symptoms are more or less marked in all sudden changes of metabolism which are associated with a rapid solution of albuminous substances and an increased combustion of fat. No important

[1] Am. Med.-Surg. Bull., Mar. 21, 1896, from Pharm. Zeit., 1896, xxxvii. p. 58.
[2] Notes on New Remedies, June, 1896.
[3] Brit. Med. Jour., Mar. 21, 1896.
[4] Wien. med. Blatt., June 4, 1896.
[5] Ibid.

influence on the pulse has been observed. There is no possibility of iodin-poisoning, the quantity being much too small. Ewald has frequently found sugar in the urine after treatment with thyroid preparations, and in 1 case this has persisted for 4 years, but with no other symptoms of diabetes. As a rule, the glycosuria is only temporary. The author gives a summary of our knowledge of the physiology of the thyroid gland and of the thoroughly rational process by which the natural secretion of the gland is replaced by the artificial product. If the treatment is pushed too far, the symptoms of thyreoidismus result. The daily quantity is, at the most, 10 tablets, corresponding to 3 mgm. of iodin. In myxedema and sporadic cretinism or infantile myxedema the value of the treatment is unquestioned. In psoriasis and other skin-diseases, such as lupus, ichthyosis, xeroderma, etc., its efficacy, according to Ewald and other observers, is not yet established. In corpulence, however, the reports are unanimous that the loss of weight is prompt, but not lasting. The action of the thyroid preparations being to cause a destruction of albuminous matter and combustion of fat, the ideal method is to supply the loss of albuminoids by a suitable diet, allowing the fat to diminish without injury to the organism. The corpulent may be divided into two classes—those who are fat because of an improper diet, and those who in spite of a strict regimen remain fat; these two classes are not to be distinguished in their reaction to the thyroid treatment. Both are at times refractory, and the cause of this is at present not known. Thyreoiodin is as efficient in these cases as the extracts and dried preparations of the gland.

In a case of pronounced and persistent exophthalmic goiter under Wood's care there was an injury to the spleen, followed by abscess, which was opened, and after months of severe illness recovery occurred. In the second or third week of the splenitis the goiter began distinctly to diminish. By the fifth week the goiter had disappeared, and since the patient has recovered from her illness the goiter has not returned. We know excision of the thyroid gland produces enlargement of the spleen, so that there is some relation between the two glands. Wood has used splenic extract in 3 cases of exophthalmic goiter; 1 went home "apparently cured, and the 2 others were much benefited." The author narrates a case in which Addison's disease was apparently cured by the use of the glycerin extract of the suprarenal capsule. Other cases have come to his notice in which benefit was derived, and still others in which there was failure. In some cases failure may be avoided by ordering the suprarenal capsules from a veterinary surgeon who has himself taken them from the beef. In the cases cited the glycerin extract was used in doses of 10 to 15 ♏ hypodermically.

In continuance of the investigations of Oliver and Shafer (noted in the *Year-Book* for 1896, p. 1098), which show that the product which the medulla of the suprarenal capsule furnishes to the blood has a special affinity for muscular tissue, both striped and plain, and is in all probability intimately associated with the production of muscular tonicity, 2 cases of Addison's disease are reported,[1] 1 of which was notably benefited by the treatment. Oliver thinks it

[1] Therap. Gaz., Mar. 16, 1896.

probable that the adrenals may be of use in all conditions in which the vascular tone is reduced. In anemia and asthenia the blood gravitates to the veins of the abdomen on assuming the upright position; by the use of an arteriometer the radial artery is seen to increase in diameter in the recumbent and diminish in the erect position—the opposite of what occurs in health. This abnormal condition is taken as a general indication for the use of the suprarenal treatment. The author has observed that, as a rule, in a few days' treatment the normal relation of radial caliber to posture is restored, and maintained as long as the treatment is continued. He has also observed a rapid increase in the percentage of hemoglobin during the suprarenal treatment. Oliver has treated 2 cases of cyclic albuminuria in this manner with great temporary benefit, the albumin, however, returning when the treatment was discontinued. As a hemostatic suprarenal capsules have not proved themselves efficient, because of the enormous increase of blood-pressure which they cause.

Extracts of the bone-marrow and of the spleen have been used, but without success, in the treatment of leukocythemia. Wood[1] thinks it probable that glycerin-extracts of marrow will not prove of value in these cases, since there is already too much marrow-activity. In severe anemias, however, there is sufficient evidence to warrant the administration of the medullary glycerid. Danforth[2] expresses the opinion that this treatment has shown better results than that with iron or arsenic. Janeway[3] lays stress upon the uncertainty and gravity of the prognosis in cases of pernicious anemia. He has seen a marked temporary improvement following treatment, but has yet to see a case in which the result was permanent. He related a case, however, in which a marked improvement was brought about, and persisted to the present time, from the use of bone-marrow. Stengel[4] has seen marked temporary improvement in a case of pernicious anemia from the administration of a glycerin "jam" of bone-marrow. The glycerin extract made from calves' ribs was inefficient; raw bone-marrow soon became repulsive to the patient; so the author took the red marrow from the tibia of the calf, mixed it with an equal quantity of glycerin, and rubbed it up in a mortar; in this way a preparation was made, the taste of which was pleasant, and which did not derange the stomach of the patient. From 1 to 2 oz. were administered daily.

Cohnstein[5] reports the results of the treatment of 22 cases of chlorosis by means of an extract of the spleen. In $\frac{2}{3}$ of the cases there was a distinct improvement. In a minority of the cases there was no perceptible result. The extract is said to have the consistency of honey, and to be sterile and permanent. It has an aromatic or spicy odor and taste, and may be used in the same manner as Liebig's extract. It is manufactured under the name of erythrol. Gritzmann[6] has treated 4 cases of malarial cachexia with the spleen and bone-marrow of cattle, with apparently favorable results.

[1] Loc. cit.
[2] Am. Med.-Surg. Bull., May 16, 1896.
[3] Ibid.
[4] Therap. Gaz., May 15, 1896.
[5] Allg. med. Central-Zeit., No. 43, 1896.
[6] Allg. Wien. med. Zeit., June 30, 1896.

Antispasmin.—Stoos[1] speaks favorably of the use of this remedy in whooping cough, especially in children under 1 year, in whom bromoform may be dangerously narcotic in its action. The action was not always the same; while in most of the cases the severity of the spasms was at once diminished and their frequency lessened, in some cases this action was reversed. The only other action of antispasmin, even in very young infants, was a slight constipation. For children under 1 year the dose is $\frac{1}{4}$ to $\frac{1}{6}$ gr. 3 or 4 times a day. [The composition and dosage of antispasmin are given in the *Year-Book* for 1896, p. 555.]

Apolysin.—Nencki and Javorski[2] write of a new analgesic and antipyretic which is closely allied to phenacetin. In the latter acetic acid is combined with phenetidin, whereas in apolysin citric acid is used. It is a fine yellowish-white crystalline powder, slightly acid to the taste and acid in chemic reaction. It has a slight odor, is soluble with difficulty in cold water, and is readily soluble in hot water. Lithium, magnesium, and sodium salts of apolysin have been made. The authors have used apolysin in a variety of cases, including croupous pneumonia, scarlet fever, typhoid fever, influenza, various forms of neuralgia, etc., in doses not larger than 92 gr. daily, single doses from 8 to 23 gr. The great advantage which this substance has over phenacetin is its solubility and consequent greater rapidity of action. No unpleasant effects were noted from its use. It should not be given on an empty stomach or when the secretion is very acid, as decomposition ensues. Jéz[3] reports that in his hands apolysin has not shown itself a useful analgesic, and that it is only weakly antipyretic in its action, but that in 50 cases no ill effects were noticed. Cerna,[4] however, has seen death follow the intravenous injection of 45 gr. in a dog. Death was caused by a simultaneous arrest of the respiration and heart, the symptoms of asphyxia being well marked. There was considerable hematuria and cyanosis, with a distinct discoloration of the blood.

Arecolin Hydrobromate.—Mouquet[5] concludes from experiments on 2 horses that this drug acts similarly to, but more powerfully than, eserin and pilocarpin; it is also cheaper than the latter. Bardet[6] claims that the drug approaches pelletierin more nearly than it does eserin and pilocarpin. Areca-nut has been used successfully as a teniacide. Because of its energetic action small doses, $\frac{1}{16}$ to $\frac{1}{32}$ gr., must be used at first. Lavogna[7] says that a 1% solution in the conjunctival sac is followed by some warmth, tears, and slight spasm of the lids. The signs of irritation pass quickly and are followed by a slight bulbar hyperemia. In 5 minutes myosis begins, which reaches its maximum in about 10 minutes and lasts about 30 minutes, when the pupils begin to dilate, the normal size being reached in about 70 minutes; $1\frac{1}{2}$ hours afterward slight mydriasis is seen. The spasm of the ciliary muscle reaches its

[1] Allg. Wien. med. Zeit., June 30, 1896, from Mittheil. aus dem Geb. der Kinderheilk., xxix.
[2] Squibb's Eph., Jan., 1896.
[3] Wien. klin. Woch., 1896, No. 22, p. 466.
[4] Jour. Am. Med. Assoc., June 20, 1896.
[5] Am. Jour. Med. Sci., from Les Nouv. Rémèdes, 1895, No. 22, p. 505.
[6] Ibid.
[7] Therap. Monatsh., 1895, H. 7, S. 364.

maximum in from 1 to 6 minutes, reaching the normal again in about 35 minutes after the instillation.

Argentamin.—Munger[1] reports that this was of much value in the treatment of catarrhal and purulent rhinitis, a 5–10% solution being applied to the well-cleansed mucous membrane by the physician not oftener than every second day. A ½ to 2% solution may be given the patient for daily use at home. The older silver salt seems better in chronic laryngitis.

Argonin.—Liebrecht[2] claims for this new silver salt important properties, as it apparently possesses the bactericidal, but not the caustic, action of the nitrate. Casein acts as an acid and gives a soluble silver salt when a solution of its sodium compound is mixed with nitrate of silver. Alcohol gives a white precipitate in the form of a fine powder, argonin, which is easily soluble in hot water, with difficulty in cold water. This substance is believed by Meyer to have antiseptic properties of considerable value. Solutions of a strength of 3% and 4% have no caustic action on mucous membranes, and are apparently efficient in affections of the urethra and conjunctiva.

The Atropin Group.—After a review of the literature for the past 20 years, Sharp[3] concludes that daturin and duboisin may be called impure atropin. The varying effects obtained by different observers in the case of hyoscin and scopolamin may be accounted for on the supposition that neither is a definite base. Hyoscyamin may be considered identical with atropin. Atropin is the alkaloid of which we know most, and may be called the fundamental or representative base; and our knowledge permits us to say at least that in hyoscin and scopolamin we have a certain proportion of atropin along with a certain proportion of a conversion-product or decomposition-product of atropin which might be called *α* tropeine. The author has used hyoscin hydrobromate clinically, and is unable to find that it differs in any way from atropin. He thinks that different samples may vary and account for the different results obtained by different observers. In favor of there being only one base the following considerations are advanced: 1. All authorities agree that one base readily passes into the other, as, for example, atropin may be changed readily into hyoscyamin, and vice versa; 2. In experiments on the frog's heart one will replace the other; stop the heart with muscarin, and any one will start it; stop the heart by simple exposure to the air, and any one will start it, within certain limits; 3. They are all mydriatic; 4. They all possess hypnotic action; 5. They all react in the manner of caustic potash or soda toward alcoholic solution of mercuric chlorid. Instead, then, of multiplying names, we should call atropin what is usually atropin, and get the others free from any admixture, and name the resulting products by names corresponding to homatropin.

Belladonna-poisoning.—Montgomery[4] describes a case in which the diagnosis was rendered doubly difficult by the absence of dilatation of the pupils, and because the poisoning was caused by a belladonna plaster the pres-

[1] Am. Med.-Surg. Bull., May 16, 1896.
[2] Therap. Monatsh., 1895, H. 6, S. 306.
[3] Brit. Med. Jour., Dec. 21, 1895.
[4] Med. News, Jan. 25, 1896.

ence of which was unsuspected. [The absence of mydriasis would certainly suggest the presence of another ingredient in this plaster, so constant a symptom of belladonna-poisoning is dilatation of the pupils.]

Benzonaphtol has been mentioned favorably this year as an intestinal antiseptic. Huchard[1] has recommended its use in cachets with powdered charcoal and pancreatin. Clark[2] reports his success with it in an epidemic of dysentery in Cuba. The total number of cases treated was 137, of which 23 were grave and 114 mild. The mortality among those treated with ipecac, calomel, opium, and the other usual agents was 9%, with the benzonaphtol just over 2%. Recovery was more rapid and there was not the usual depression; 46 gr. a day were given to adults and about the same dose to children. [We are gratified to observe these favorable reports, for benzonaphtol has certainly not been given its deserved credit as an intestinal antiseptic.]

Borax-insufflations in Constipation.—Merkel[3] reviews the literature of intestinal disorders, especially of flatulence, and describes the results obtained by Crämer in constipation by the use of boric acid. The nozzle of a powder-blower, well oiled, is introduced into the rectum and 30 to 60 gr. are insufflated. The treatment should be continued for 4 to 6 weeks, but marked improvement may occur in the first week, often after the first injection. Generally, within 15 minutes there is a tendency toward a movement of the bowels. There is a large amount of fecal matter expelled with considerable odorless gas. The stool is soft in consistency. If intestinal atony is present, other methods must be used in combination to produce a thorough daily evacuation.

Boxwood has been recently recommended by Artaud and Gadot[4] as useful in certain forms of intermittent fever with hyperplastic and parenchymatous lesions, in which it acts as a cholagogue. The drug has been employed for a long time in syphilis, herpes, and rheumatism, but has, it would seem deservedly, fallen into disuse. As an antipyretic, however, it has been employed by Pavia and others, who consider it a useful substitute for quinin in malarial fevers. The tincture of buxus and buxin sulphate are said to have drastic properties.

Brazilian lantana is recommended by N. Lugo-Vina[5] of Cienfuegos as a powerful antiperiodic. It is said to be a verbenaceous plant growing in the South American forests. It has long been esteemed by the natives in the "marsh fevers." The active principle is lantanin, the daily dose of which is 15 to 30 gr., best given in a pill of 2 gr. every 2 hours. Like quinin, it produces a moderate effect on the circulation, and is in no way irritating. The author claims that it is effectual in some cases that resist quinin.

Bromic Intoxication, Certain Effects of.—Under this heading Weir Mitchell[6] discusses the unusual actions of the bromids which follow their excessive use. He says that the symptoms for which the drug was taken often

[1] Squibb's Eph., Jan., 1896. [2] Ibid.
[3] Am. Jour. Med. Sci., Apr., 1896, from Münch. med. Woch., 1895, No. 52, S. 1209.
[4] N. Y. Med. Jour., June 27, from Jour. des Pract., June 6.
[5] Brit. Med. Jour., Oct. 5, 1895, from Rev. de Cien. med., July 20.
[6] Am. Med.-Surg. Bull., May 16, 1896.

become much worse under its use, especially during menstruation. It causes delusions, suicidal tendencies, etc. Irritability of temper is a frequent result. It also has some effect on the urine. In chronic cardiac asthenia the symptoms grow worse. A tendency to ptosis is a common sequence. The author has also seen, during administration, the development of paresis and an inability to walk, sometimes more marked on one side of the body, resembling hemiplegia. In this respect it resembles the well-known effects of alcohol where it occurs that a man seems to be more drunk on one side than on the other. The left side was more commonly affected. The use of bromids also led to loss of memory, going on to partial paresis, with involuntary movements of the bowels. Janeway[1] has seen a number of deaths which could only be explained by the inordinate use of bromids.

Another drug in the same category is **bromosoda,** which drunkards make use of when they want to reform, and it is just in these cases of cardiac depression that the bromids are most dangerous. Hare in the discussion following dwelt with emphasis on the depressing effects of potassium on the heart and respiration, and expressed the opinion that these effects of potassium bromid might be due to the potassium as much as to the bromid. Dana, on the other hand, does not believe that potassium has anything to do with the depressing effects of potassium bromid, in which opinion Weir Mitchell seemed to concur: he uses lithium bromid when giving it alone, because it contains more bromin than any other form. Hare[2] pursues the subject with some warmth, and brings evidence and authorities which seem conclusive to the support of his opinion, that potassium salts are per se poisonous, and that the action of potassium bromid depends for its depressant effects on the potassium.

Potassium Bromid.—Taty[3] finds that the combination of potassium bromid with adonis vernalis and codein has not, in his experience, the favorable results claimed by Bechterew. The addition of codein seems to produce constipation and somnolence, which were not noted when this drug was absent. The adonis does not much affect the circulatory system, although the heart-beats seem less full and a little more frequent. The occurrence of the epileptic crises does not seem to have been influenced other than by the bromid alone, and the combination does not prevent the complications and disagreeable symptoms which arise during the administration of the potassium bromid.

Calcium sulphid is recommended as a prophylactic of influenza by Green;[4] 1 gr. daily was given during several epidemics, with the result that those treated seemed to acquire an immunity, while others under the same conditions, who did not receive calcium sulphid, were attacked. The author states that 3 days are required to saturate the system sufficiently to prevent infection, and the drug has less effect than quinin when taken after exposure; still, it does modify to some extent the course of the disease.

Carbolic-acid-poisoning, Alcohol as an Antidote in.—Fraser[5]

[1] Am. Med.-Surg. Bull., May 16, 1896. [2] Therap. Gaz., July 15, 1896.
[3] Ibid., May 15, 1896, from Lyon méd., Dec. 29, 1895, Jan. 5 and 12, 1896.
[4] Squibb's Eph., Jan., 1896, from Brit. Med. Jour., vol. i., for 1895, p. 974.
[5] Med. Rec., Nov. 23, 1895.

claims that the corrosive action of carbolic acid is greatly diminished if it is diluted with an equal quantity of alcohol. A woman who had attempted to commit suicide drank an unknown quantity of phenol in a glass of whisky, and suffered not at all from pain, nor were there any signs of corrosive action on the lips, tongue, or throat. The patient was in a profound stupor, with pupils contracted to pin-point size. The pulse was strong and regular, respiration undisturbed. There was slight jerking of arms and legs, with anesthesia of extremities. Almost constant vomiting followed this condition, lasting 24 hours, after which recovery was complete. The writer states that the local action of phenol may be so influenced by alcohol that the white stain and burning disappear entirely. Carleton[1] claims the same antidotal effect, as regards the skin and mucous membranes, for vinegar.

Carbon Dioxid, the Influence of, on the Sexual Organs.—Schuster[2] observes that the irritation of the skin produced by bathing in water containing carbon dioxid is manifested by a sensation of heat and prickling, with redness, especially pronounced about the genitals. This irritation, the author claims, may be used to stimulate the centers, spinal and cerebral, and is of use therapeutically in sexual debility not dependent on organic disease. It is contraindicated in spermatorrhea, but may be of service in precocious senile impotence. The use of carbon dioxid in the form of baths, douches, etc. is indicated in the anaphrodisia of women, and, according to the author, has been found useful in uteroovarian neuralgia, in dysmenorrhea, and amenorrhea.

Bitterless Cascara Sagrada.—According to Gilpin,[3] the researches of various investigators have proved that the laxative properties of the bark of this tree are undoubtedly due to principles similar in their medicinal properties, and to a great extent in their chemic composition, to those contained in rhubarb and frangula. Cascara sagrada differs, however, from rhubarb in the bitter principle which it contains. Meier and Webber assert that the drug also contains a ferment, to which is attributed the griping effects of the fresh bark, and the bark should be kept at least 1 year after its collection before being used, as is the rule with frangula-bark. The resinous constituents are probably the cause of the purgative action. Gilpin gives a method of making a powder which will contain all the resinous constituents, but which shall be free from bitterness. This powder may be used for making liquid preparations: Take of powdered cascara sagrada 500 gr.; licorice-root 110 gr.; magnesia (calcined) 10 gr.; powdered cloves 5 gr. The powders are thoroughly mixed, transferred to a "power-kneader," and then moistened with sufficient water; after being thoroughly kneaded the mass is transferred to a closed drying chamber and subjected to a uniform temperature of 180° F. for 48 hours. The moisture is then permitted to escape from the chamber and the powder thoroughly dried, after which it is repowdered and sifted.

Chlorids of Sodium and Potassium in Metabolism.—According to

[1] N. Y. Med. Times, Nov., 1895.

[2] N. Y. Med. Jour., from Gaz. hebdom. de Méd. et Chir., Apr. 16, 1896.

[3] Am. Jour. of Pharm., Mar., 1896.

Pugliese,[1] sodium chlorid in doses of 0.25–0.5 to the kgm. has in the dog no diuretic action; it causes an increase of weight, raises the coefficient of digestibility of protein, lessens nitrogenous metabolism, leads to a retention of the sodium salts on the part of the tissues, while bringing on an increased elimination of potassium; finally, it does not modify the elimination of the phosphates. Potassium chlorid in doses of 0.25 g. to the kgm. seems to have only a diuretic action. The chlorids of both sodium and potassium cause increased metabolism and hasten interchanges in the tissues. When given together, an increased elimination of sodium is soon apparent in the urine, while an accumulation of potassium takes place in the tissues. Sodium, concludes the author, is then a moderating element in metabolism, while potassium is an excitant.

Chinosol.—Ostermann[2] recommends this new compound as a disinfectant and deodorizer. It is said by the manufacturers to be made from potassium pyrophosphate, 25 parts; oxychinolin, 29 parts; alcohol, 120 parts. It is freely soluble in water. On boiling, a neutral sulphate of potash and neutral oxychinolin are formed. It is especially useful as a disinfectant and deodorizer of fetid ulcers and cavities. It is said to limit secretion and suppuration, and to be nonpoisonous and nonirritating: the author is convinced of the latter statement, as he has used it with success in gonorrhea in strong solution and in the form of gauze and the pure powder, in the abdominal cavity.

Chloral, a Chemic Antidote for.—Chloral is quickly decomposed outside of the body at and above 60° F. in an alcoholic solution of potassium into formate of potassium and chloroform, and somewhat less quickly in an aqueous solution of potassium. Dougall[3] therefore recommends the use of liquor potassæ as an antidote; 80 grains of chloral would require, theoretically, 27 gr. of potassium for its decomposition; this may be given as liquor potassæ, 112♏ every hour, reducing by degrees the dangerous quantity of chloral. The formate of potassium merely produces a peculiar eruption similar to that of chloral, while the chloroform would be exhaled as rapidly as produced. As the maximum dose of liquor potassæ is 60♏, the antidote must be given very well diluted in gruel, warm milk, or barley-water.

Chromic-acid Poisoning from the Vagina.—Sticker[4] reports a case in which, after a single application to the cervix of pure chromic acid, there ensued almost immediately collapse, suppression of urine, and frequent bloody stools. The urine contained much albumin, blood, and epithelium from the kidney. Recovery was slow, but complete.

Cocain-poisoning, with fatal result, is reported by Curgenven[5] after the ingestion of a solution containing 10 gr. of the salt. The bottle had stood for a year in a warm room, and the author suggests that the fatal result may have been due to the mould or to toxins generated thereby. [Although we cannot deny that this explanation of the cause of poisoning is possibly true, it is certainly improbable, to say the least.] Violent tetanic spasms, cyanosis,

[1] Univ. Med. Mag., Jan., 1896, from Arch. di Farm. e Terap., vol. iii. fasc. 7, July, 1895.
[2] Therap. Monatsh., Mar., 1896. [3] Therap. Gaz., July 15, 1895, from Glasgow Med. Jour.
[4] Münch. med. Woch., July 9, 1895. [5] Quart. Med. Jour., Jan., 1896.

shallow respiration, and a rapid and thready pulse followed the taking of the dose, and lasted 40 or 50 minutes until death supervened. Garland [1] describes a fatal case in which the patient swallowed ʒij of a 10% solution of cocain. She almost immediately afterward suffered from vertigo, followed by 9 epileptiform convulsions, and died within 40 minutes. The autopsy did not reveal the cause of death. This case, says the writer, lends support to the correctness of Mannheim's estimate that the fatal dose of cocain is about gr. xv. In the present state of our knowledge it is, however, practically impossible to state the smallest lethal dose, seeing that gr. $\frac{2}{3}$ has caused death, and so minute a dose as gr. $\frac{1}{100}$ has given rise to symptoms threatening life. Ingraham [2] used oxygen with success in a case where, after taking gr. x of cocain, the patient seemed moribund; the pulse was rapid and almost imperceptible, respiration shallow, the lips and extremities blue, and consciousness abolished during 18 hours, during which time morphin, atropin, and alcohol had been given without success; the lungs were becoming edematous. At this point oxygen-gas was first given, and the inhalations continued for 2 hours, when the patient regained consciousness and the general condition began to improve. The writer states that this case illustrates the cumulative action of cocain, as the poisoning followed gradual absorption of the drug. Pfister [3] narrates a case in which, after the injection of an unknown quantity of a 20% solution of cocain in the urethra of a patient who was young and, except for vesical calculus, possessed of good health, death followed almost immediately. This author gives the maximal dose as 0.05 gr., or about $\frac{4}{5}$ gr.; 4 drops of a 20% solution would contain this amount. Walker [4] reports a case of a man who had swallowed 8 or 9 gr. of cocain. The symptoms were constriction of the throat and region of the heart, great difficulty in swallowing, mental dulness, dilated pupils. He resembled a bad case of chorea; the movements, however, were slower and more regular. The body was alternately rotated from side to side and bent at the same time, while the arms and legs were never still. Amyl nitrite gave rapid relief, all of the symptoms disappearing in 5 or 6 hours.

Caffein and Theobromin.—Albanese [5] states that when caffein is administered to dogs in large doses by the mouth about 7% of it passes unchanged into the urine; 10% more is found in the urine as monomethylxanthin—a substance which, according to the author's researches, is to be considered as an intermediate product of the final transformation of caffein into urea and ammonia. Theobromin behaves in the same way, only in this drug the transformation is less rapid and less complete. In man the ingestion of tea or coffee produces a very sensible increase of the xanthin bases that are to be found in the urine, but it is impossible to detect either caffein or monomethylxanthin. With regard to this last substance, it is said to possess diuretic properties analogous to those of caffein, but to a more marked degree.

[1] Univ. Med. Mag., Feb., 1896, from Lancet, Nov. 2, 1895.
[2] Med. News, Feb. 22, 1896.
[3] Berl. klin. Woch., Apr. 6, 1896.
[4] Univ. Med. Mag., July, 1895, from Lancet, Feb. 2, 1895.
[5] Ibid., Sept., 1895, from Arch. f. exp. Pathol. Pharm. u.

Coffee-poisoning.—Gilles de la Tourette[1] states that chronic coffee-poisoning is much more common than is supposed, and is generally confounded with alcoholic disturbances. The poison acts principally on the stomach and the nervous system. The coffee-dyspepsia resembles the alcoholic very much: there are, as symptoms, morning expectoration of mucus, pain in the epigastric region, and marked anorexia. The disgust for food finally becomes so great that the patient can only take coffee or bread soaked in coffee, and in this manner the poisoning rapidly increases in severity; nausea and vomiting, with acid pyrosis, next appear, and the patient becomes much emaciated. On the side of the circulation a slowing of the pulse is usually observed, palpitation being rare. The nervous symptoms are marked. Insomnia is common, or, if sleep occurs, it is often accompanied by terrifying dreams. General tremor is often present, with fibrillary twitching of the lips and tongue. Cramps in the limbs may occur. The general sensibility is diminished in a certain number of cases. Paralyses have not been observed. In children arrest of development takes place. The stoppage of the coffee generally results in a rapid cure—much more rapid than in alcoholism.

Cresochin.—Under this name a nonalkaline cresol disinfectant is prepared which is stated[2] to be a neutral combination of tricresyl sulfonate and quinolin with tricresol. It contains 33% of quinolin and 17% of tricresyl. It is not caustic, and is soluble to the extent of 1 in 25 in water. It is especially indicated as a disinfectant, since, being free from alkali, it does not set free ammonia from nitrogenous organic matter.

Cyanid-poisoning, Treatment of.—In a previous communication Lang[3] showed that cyanic acid, like formonitril, as also the much less dangerous acetonitril, is transformed in the body into the relatively harmless thiocyanic acid. The attempt is now made[4] to imitate and support this physiologic process. Among a number of agents tried, sodium thiosulphate antagonized successfully a dose of hydrocyanic acid 2 or 3 times the fatal strength in animals. If the poison was taken by the mouth and the antidote given subcutaneously, it was possible to render a dose 3 or 4 times that of the lethal dose harmless. Of other substances suggested as antidotes for this poison, potassium permanganate and hydrogen peroxid were unavailing. Cobaltum nitricum was efficient, but not more so than the thiosulphate of soda. [The description of the use of cobalt as an antidote for cyanic acid will be found on p. 1062 of the *Year-Book* for 1896.]

Digitalis and its Alkaloids.—As a result of recent experiments, Franck[5] concludes that digitalis acts equally on the two hearts, and not more strongly on the right, as claimed by M. Sunor, nor on the left, as English authorities assert. The author also asserts that an infusion of the leaves of digitalis produces a more marked action on the heart than a corresponding

[1] Am. Med.-Surg. Bull., Mar. 7, 1896, from Gaz. méd. de Paris, July 20, 1895.

[2] Druggists' Circ. and Chem. Gaz., July, 1896.

[3] Arch. f. exper. Pathol. u. Pharm., xxxvi. 1 u. 2, p. 75, 1895. [4] Schmidt's Jahrb., i. 96.

[5] Canad. Pract., Dec., 1895, from Gaz. des Hôp.

dose of digitalin. Koplik[1] writes of the uses and abuses of digitalis in pediatrics. There is no drug of greater utility, but the most gratifying effects are obtained from small doses rather than from the larger quantities. There are children, however, who react in a peculiar way. Some preparations of digitalis have no effect on these children in small doses, yet when the larger dose is given or a substitution made—as, for example, the powder replaced by the fluid extract—we have striking digitalis-effects shown by the action of the heart, and the administration of the drug must be suspended. The writer says these children should never receive digitalis in any form, as the drug is a direct cardiac poison to them. Two well-marked cases are given, 1 of scarlatinal nephritis, the other of pneumonia, showing the usual cumulative action of digitalis on the heart and persistence of the symptoms for 2 or 3 days.

Digitoxin.—Wenzel[2] has used Merck's digitoxin in a number of cases of valvular disease, myocarditis, and nephritis. In most of the cases there were disturbed compensation, engorgement of the pulmonary circulation, and marked diminution of the urine. The drug was always given by the rectum in the following manner: 15 g. of a solution of digotoxin .01, alcohol 10, aq. dest. 200, were administered in 100 g. of lukewarm water, at first 3 times, then twice, finally once daily; gr. $\frac{1}{188}$ then was given at each dose. In only 2 cases was an unpleasant result noted—vomiting, which soon ceased. The effect on respiration, pulse, quantity and specific gravity of the urine, and on the albumin present was very pronounced, even in cases in which other remedies, including digitalis, had been tried in vain. The method of administration reduces to a minimum disturbances of the alimentary canal. Corin[3] speaks with equal enthusiasm of the efficacy of this drug in pneumonia. It was given according to the following formula: ℞. Digitoxin (Merck), gr. $\frac{1}{20}$; chloroform and alcohol, āā. q. s. ad. solv.; aq. dest., ℥vij. Sig. One-third to be taken every 6 or 8 hours. Vomiting occurred only in 3 or 4 of the 53 cases treated, and may be prevented by not giving the drug in a concentrated form or in too large a dose. The author does not allow the patient to take food for an hour before or after administration of the drug. During the 2 years in which he has used digitoxin, Corin states that he has had no ill effects from it, and no sign of cumulative action. The indications for discontinuing its use are, as in digitalis, slowing and intermittence of the pulse, but it is not dangerous to continue the drug until intermittence begins. There is time to stop after this commences, as it occurs, at the most, 6 hours after the last dose. [Digitoxin would seem more nearly to represent the value of digitalis than any of the other principles of that drug, and its use appears to be growing more general. Compare *Year-Book* for 1896, p. 1035.]

Enuresis, Treatment of.—Nason[4] reports that a woman of 20 had suffered from the earliest childhood, scarcely ever missing a night, and on some

[1] N. Y. Med. Jour., Feb. 8, 1896.

[2] Therap. Gaz., Nov. 15, 1895, from Centralbl. f. innere Med., May 11, 1895.

[3] Therap. Woch., Aug. 11, 1895.

[4] Am. Jour. Med. Sci., May, 1896, from Brit. Med. Jour, 1896, No. 1832.

occasions wetting the bed 2 or 3 times in a single night. After the usual medication had failed a No. 10 catheter was passed into the bladder and connected by a tube with an irrigating basin containing a quantity of boric-acid solution. The basin being raised from 1 to 2 feet, the bladder was injected until the patient complained of slight pain. The positive electrode of a constant-current battery was applied over the lumbar spine, and the negative placed in the fluid in the basin; a weak current was then allowed to pass for 10 minutes. This was repeated every evening for 2 weeks, then at longer intervals. By this method it is said that a current of electricity would, after passing from the neighborhood of the lumbar cord through the vesical nerves, be evenly distributed over the walls of the distended bladder. The toleration of the bladder was rapidly increased from 4 oz. on the first occasion to 20 oz. at the end of a fortnight. After some months of treatment the urine could be retained for a much longer period, and for nearly 4 months the patient has been practically well. [The possible influence of suggestion in this case, in the absence of evidence to the contrary, must necessarily impress one.]

Erythrophleum.—Harnack[1] describes important changes in the hydrochlorate of this drug as compared with the specimen obtained from the same manufacturer and examined by him in 1882. At that time the action was that of digitalin and picrotoxin (clonic convulsions) in warm and cold-blooded animals. The recent preparation gives only the action of digitalin. The chemic reactions are also different. Formerly, the base, its salts, and double salts could only be produced in the form of a clear syrup; now the salt forms a fine, bright-yellow, amorphous powder. The new preparation of Merck seems to deserve consideration as a substitute for digitalis and strophanthus, as it raises the blood-pressure energetically and is not cumulative in its action. Neither the author nor the manufacturer is able to state wherein the difference lies. It seems probable, however, that the two specimens come from different kinds of bark or from different species of the same tree.

Eucain.—Kiesel,[2] a Berlin dentist, claims that this new artificial alkaloid, said to be the methylester of a benzoylated oxypiperidin carbonic acid, is as efficient as cocain in inducing local anesthesia, and in some respects is superior to that drug. The heart is in no way influenced; in very nervous patients, whose pulse had risen to 120 or 130 before the operation, the heart-beats become normal and regular very soon after the injection. The anesthesia is more extensive in area and lasts longer than that of cocain. In some experiments the effect extended even to the muscles. In a case in which an injection was made over the first incisor there occurred paralysis of the ala nasi and anesthesia of the nasal mucous membrane on the right side. The sense of smell was not interfered with. As much as 30 gr. may be injected without risk, while an equally safe dose of cocain is only gr. $\frac{1}{6}$. Solutions of 15% strength in sterilized water are permanent at the ordinary temperature of the room. They remain clear without the addition of an antiseptic, and do not become

[1] Berl. klin. Woch., Sept. 2, 1895.

[2] N. Y. Med. Jour., May 9, 1896, from Zahnärztl. Rund., Apr. 5, 1896.

flocculent, as does cocain. Finally, it is said that eucain will be obtainable at a price considerably lower than that of cocain.

Schleich[1] states that the alkaloid is soluble with difficulty in water, but that it forms an easily soluble hydrochlorate, which may be applied to the surface of mucous membranes or injected in solution of the strength of 1 : 6½. The area of anesthesia is said to be greater and the duration longer than when cocain is used. The most complete study of this drug that has yet come to hand is that of Dr. Gaetano Vinci.[2]

Two forms of eucain hydrochlorid—that crystallized from a watery solution and that from a methyl-alcohol solution—were used in laboratory and clinical experiments. The latter causes slight hyperemia and irritation, and is, apparently, not more efficient than the watery solution, which is preferable for practical use. A solution of from 2 to 5% instilled into the eye of a rabbit caused complete local anesthesia in from 1 to 3 minutes. It is stated that the pupil was not dilated and reacted to light, and that accommodation remained normal. The general action of the drug, both in cold-blooded and warm-blooded animals, consisted in a marked excitation of the entire central nervous system, followed by paralysis when toxic doses were given, going on to death. Even gr. $\frac{1}{33}$ caused irritability, heightened reflexes, incoordination, and finally general paralysis in animals. Small doses administered to mice and rabbits caused increased reflex excitability, and increased but weakened respiratory movements. Medium doses, of from $\frac{1}{3}$ to $\frac{1}{2}$ gr. to each 35 oz. of the animals' weight, caused repeated clonic and tonic convulsions. The animals lay senseless on their sides, with dyspnea, opisthotonos, and finally paresis of the posterior limbs. The animals finally died when the paralysis reached the respiratory muscles. When the dose was not a fatal one the convulsions gradually ceased, the increased reflex excitability disappeared, and the paresis of the hind limbs slowly improved. The author concludes that the effect of eucain on the central nervous system is at first exciting, then, in the case of toxic doses, paralyzing. The paralysis is a central one, for if the sciatic nerve of a frog poisoned with eucain is exposed and its peripheral end irritated with the induced current, the limb reacts in a normal manner. As regards its action on the heart and blood-vessels, the subcutaneous and intravenous injection of small and medium doses slows the heart's action, on the average, from 20 to 30 beats a minute, but without otherwise modifying the beats or increasing the blood-pressure. This effect on the pulse is caused by the excitation of the central vagus; for section of the vagi causes an immediate increase of the pulse to the normal and above it, together with an increase of the blood-pressure. Death occurs from paralysis of the respiratory center, for the heart continues to beat for some time afterward. In all these points, says the author, eucain is similar physiologically to cocain, but it is less poisonous. While the animals treated with eucain survived, those treated with the same doses of cocain died. The pulse with eucain is always diminished in fre-

[1] Am. Med.-Surg. Bull., June 6, 1896.

[2] N. Y. Med. Jour., June 20, 1896, from Deutsch. med. Zeit., Apr. 27.

quency; with cocain there is a primary acceleration. As regards their local action, the promptness of the anesthesia, its duration and intensity, there is no difference between the two substances. Eucain causes no ischemia; on the contrary, vascular dilatation occurs. A further difference, of great importance in ophthalmology, is that the pupils and accommodation are not affected. A later investigation conducted by Vollert[1] in Leber's clinic at Heidelberg does not substantiate the above in every particular. A 5% solution of eucain causes in the conjunctival sac a much greater irritation than cocain, the pain, lachrimation, and redness lasting 1 or 2 minutes. This followed the use of even a 1% solution. Anesthesia lasts from 8 to 12 minutes. There is hypotonos, as with cocain, and mydriasis, with paresis of accommodation. The chief obstacle to its use in ophthalmology is the injury to the corneal epithelium, which, according to the author, will prevent its substitution for cocain.

Exalgin.—Weber[2] reports an instance in which, after 1½ oz. had been taken, there were rotatory vertigo, blunted sensibility, contractures, and threatened asphyxia. Anuria persisted for 24 hours, and afterward the urine contained hematin, biliary pigment, and albumin. Recovery followed after vigorous stimulation, catharsis, and bloodletting.

Fat, Subcutaneous Injections of.—Mendel[3] describes Leube's method as follows: Professor Leube of Würzburg, in treating patients with a weak heart, incidentally observed that it was possible to make 20 or more injections of camphorated oil per day without calling forth any irritation of the skin or other disturbances. In an almost hopeless case 100 injections of the same oil were made per day on 3 different days, with excellent results, and attention was thus called to the fact that 80 to 100 g. of oil could be injected daily. Leube instituted a series of experiments on dogs, in which the body-fat had been reduced to a minimum, to ascertain whether fat subcutaneously injected in such animals could be assimilated. Butter was selected for his experiments, since this fat contains—in addition to palmatin, stearin, and olein—glycerids of the lower volatile fatty acids in considerable quantities. A dog was fed on lean meat daily until the animal remained of constant weight for 4 weeks, and an absence of body-fat could thus be assumed, as the dog appeared extremely emaciated. In addition to the continued feeding of meat, liquid butter of about body-temperature was injected daily beneath the skin of the limbs. A total of 2450 g. of butter was injected subcutaneously. On postmortem examination an abundant deposition of fat was found in the mesentery, about the heart and kidneys, as well as subcutaneous layers of adipose tissue in the region of the abdomen and back. The subcutaneous abdominal fat proved to be almost pure butter; the fat in the region of the back was about ⅓ and the pericardial fat about ⅙ butter-fats; that of the kidneys and mesentery, however, did not differ materially from ordinary dog-fat:

In a second experiment a dog, as before, was brought to constant weight and laparotomy performed; thus it was observed that fat was not present in

[1] Münch. med. Woch., 1896, No. 22. [2] Am. Jour. of Med. Sci., Feb., 1895.

[3] Am. Med.-Surg. Bull., Feb. 8, 1896, from Dietet. and Hyg. Gaz., xi., 1895.

the subcutaneous tissue, and that mere traces were to be seen in the mesentery. The wound was again closed and healed rapidly. In the following 1½ months a total of 1400 g. of fat was injected under the skin of the thigh, meat being fed as previously. During this time body-weight increased from 3.880 kilos to 5.360 kilos. A second laparotomy was performed, and it was now found that the subcutaneous abdominal tissue, as well as the mesentery, were abundantly supplied with fat. The wound was closed and a lean-meat diet alone was given; then the body-weight slowly decreased to 3.850 kilos. On postmortem examination there was found to be a complete disappearance of fat from the tissues. The experiment shows conclusively that the butter-fats subcutaneously injected were deposited in the tissues, and that the fat thus assimilated was completely utilized in body-metabolism. At the end of 3 months only traces of the 1400 g. of fat injected remained. Regarding the subcutaneous absorption of fat, Leube thinks it probable that this substance passes through the spaces of the connective tissue into the body-cavities, and thus farther.

Ferratin.—Marfori,[1] whose work was discussed in the *Year-Book* for 1896, publishes the results of some recent experiments upon the absorption of ferratin and its physiologic action. The amount that can be absorbed depends largely on the condition of the mucous membranes. Sulphuretted hydrogen slowly decomposes ferratin in the intestine, thus reducing the quantity absorbed. The large amount taken up after the administration of saline purgatives is due to a desquamation of the upper layers of the intestinal epithelium caused by the purgative, which exposes a thinner layer of young cells, through which absorption takes place more rapidly. The amount absorbed varied from 11% to 30% of the amount administered. Experiments on animals and clinical experience show that there is no danger in the continued administration of the drug.

Formalin in ½ to 2% solution is an effective deodorizer and disinfectant, and especially useful in syphilitic ulcerations. Munger[2] narrates 2 cases which show its usefulness in this direction.

Galactagogues.—Experiments made by Griniewitch[3] show that there are a few drugs which really increase the quantity of milk secreted, and are said not to act detrimentally upon it, the specific gravity being unchanged and the fat being even somewhat increased. The most efficient of the galactagogues examined by the author was a plant unknown in medicine, the common goat's rue, Gallega officinalis; a tincture containing 6.5% of the extract is made. The dose is 50 to 100 drops 5 times a day. The common stinging nettle, Urtica urens, is next in efficiency, and is given in doses of 250 to 500 drops daily of a 20% tincture of the extract. Cumin, anise, and fennel are also said to act on the secretion of milk, and may be given in powder, 15 gr. from 1 to 5 times daily.

Glycosuria after the Ingestion of Sugar.—Linossier and Roque[4]

[1] Univ. Med. Mag., Nov., 1895, from Arch. ital. de Biol., t. xxiii. fasc. i., ii.
[2] Am. Med.-Surg. Bull., May 16, 1896. [3] Ibid., Aug. 1, 1895, from Lancet, 1895, i. p. 1597.
[4] Quart. Med. Jour., July, 1895, from L'Union méd., 1895, No. 13, p. 150.

have experimented upon 19 persons, either in good health or with diseases not likely to affect their assimilation of sugar, to determine the limit and conditions of assimilation. Cane-sugar, glucose, and lactose were given. After the administration of cane-sugar there was either glycosuria or saccharosuria. The latter occurred in all cases, but the quantity required to produce it in each case was extremely variable; 50 g. produced saccharosuria in 29% of the cases, and none of them resisted 350 g. There was always a small amount of glucose with the saccharose. In certain of the subjects glucose formed a large part (as much as 89%) of the total sugar eliminated. This glycosuria, which occurred in 16% of those under observation, followed the ingestion of as small quantities as 50 or 60 g. of sugar. Of the 3 sugars experimented with, saccharose passed most freely into the urine, then glucose, and finally lactose. The authors conclude that for each person and for each sugar there is an individual "coefficient of utilization," increasing within certain limits with the quantity of ingested sugar. The test employed for saccharose consisted in the addition of Fehling's solution to 5 c.c. of urine, previously boiled after the addition of a drop of hydrochloric acid. [This has more than the physiologic interest pertaining to alimentary glycosuria (see *Year-Book* for 1896, p. 1095). From a clinical standpoint the fact that the ingestion of comparatively small quantities of sugar is followed by the appearance of glycosuria in 16% of healthy subjects suggests the necessity for diagnostic caution.]

Guaiacol[1] obtained from beechwood and other creasotes has varied so considerably in purity—all the way from 50 to 90%—that an incentive has been given to perfect the previously discovered process for making a synthetic product; this has been accomplished, and an article claimed to be absolutely pure is made on a commercial scale. It is now such an important article to the medical profession that it becomes a serious question to obtain a reliable article. In addition to the numerous references given last year to its various uses, its application in glycerin to nondiphtheric sore throat may be noted. Darbonet finds that the most intense sore throats run their course without fever or pain, the general condition of the patient remaining good throughout. As a local anesthetic Championnière[2] has used guaiacol in minor surgical operations. A dose of 10 cgm. dissolved in sterilized olive oil is sufficient to obtain anesthesia; 5 minutes should be allowed to elapse after the injection. The author claims a superiority over cocain, because much larger doses may be used with safety, no accidents being noticed except slight sloughing of the gums where it had been used for the extraction of teeth; this was attributed to a faulty method of injection or to a defective solution. Rogers[3] has used creasote or guaiacol in the treatment of malarial intermittent fevers; 15 ♏ were rubbed into the axilla and covered with cotton. The average fall of temperature in ¾ hour was 1.6°, in 1¾ hours 2.3°, and after 4 hours the average fall was 3°. The fall of temperature was accompanied by a free perspira-

[1] Squibb's Eph., Jan., 1896.

[2] Quart. Med. Jour., Sheffield, Oct., 1895, from Bull. de l'Acad. de Méd., July 30, 1895.

[3] Therap. Gaz., May 15, 1896, from Indian Med. Gaz., Jan., 1896.

tion and a marked improvement in the condition and comfort of the patient. No depression was noticed, and there is no mention of chills following the use of the drug.

Coghill[1] follows Schetelig's method of giving pure guaiacol subcutaneously in acute pulmonary tuberculosis; 3 hypodermic doses, 1 of 15 and 2 of 10♏, at 4 hours' interval, in 1 case brought the temperature from 104° to normal, with rapid amelioration of all the symptoms. Guaiacol is especially useful in what the author calls the fever of the suppurative stage of the disease. A moderate perspiration usually follows the injection, but no mention is made of depression or rigor. McCormick[2] denies that guaiacol is a depressant and a dangerous remedy where the circulation has suffered from long-continued fever. He has used it in a number of cases of typhoid fever with only the happiest results. He claims also that it is a most efficient intestinal antiseptic. The same author asserts that when given internally guaiacol does not reduce the temperature to the same degree as when applied to the skin. Guimard considers this action to be the product of a reflex through stimulation of the peripheral nerve-filaments and an action on the thermic center. The lowering of temperature is said to be almost inappreciable if the region to which the guaiacol has been applied has been previously anesthetized. It is probable, however, that its antithermic action is due to its rapid absorption by the skin, as in 15 minutes the taste of the drug is perceptible. [No doubt we have in guaiacol a remedy of much value, but, so far as our observation goes, its potency in tuberculosis is a disappointment.]

Guaiacol as an Anesthetic.—Newcomb[3] states that a 5% solution upon a pledget of cotton may be applied to the nose with complete anesthesia, and that it may be used in the ear when performing paracentesis. Smith[4] believes that all the coal-tar series have anesthetic properties.

Guaiacum.—Sir Alfred Garrod[5] considers this drug valuable in many gouty and rheumatic conditions. His views are summarized thus: 1. Guaiacum is innocuous, and may be taken for an indefinite length of time; 2. It possesses considerable power, but less than colchicum, in directly relieving patients suffering from gouty inflammation of any part; it may be given whenever there is but little fever; 3. Taken in the intervals of gouty attacks, it has a considerable power of averting their occurrence; in fact, it is a very powerful prophylactic; 4. It does not seem to lose its prophylactic power by long-continued use; 5. There are a few patients who cannot readily continue its use; for such cases there are other drugs whose action is in some respects similar, of which serpentary is one of the best. Garrod does not believe that guaiacum affects the formation of uric acid, but that it acts directly on the kidney as a stimulant, enabling it to get rid of any accumulation in the tubules, thus preventing absorption from them into the blood. In confirmation of this view patients when taking guaiacum often have unusual deposits of urates in their

[1] Therap. Gaz., Apr. 15, 1896, from Brit. Med. Jour., Mar. 7, 1896.
[2] Ibid., June 15, 1896.
[3] Am. Med.-Surg. Bull., May 16, 1896.
[4] Ibid.
[5] Med. Rec., July 4, 1896.

urine. Murrell supported Garrod's conclusions as to the efficacy of guaiacum in chronic gout. He has used it for the last 6 years, not only for chronic gout, but for rheumatism, tonsillitis, and chronic bronchitis associated with a gouty taint. He favors the use of a confection. Haig agreed that guaiacum tends to ward off gouty manifestations, but could not accept the explanation of the way in which the drug acted. Potassium iodid causes diuresis and dilatation of all the blood-vessels, with a fall of blood-pressure. Lithia and ammonia have a similar action, as also has copaiba, tar, cannabis indica, certain salts of calcium, and certain bitters, such as chiretta, gentian, and possibly serpentaria. Copaiba contains a large quantity of acid, and guaiacum agrees with it in this. Haig believes that these drugs diminish the excretion of uric acid and keep the blood clear of it. Ewart thought that the action of guaiacum upon the capillaries was not limited to the kidneys, but extended to the whole system, and in particular to the capillaries of the muscles, as the effect of this drug in relieving painful manifestations located in the muscles is well known.

Hydroxylamin Hydrochlorate.—Lauder Brunton[1] suggests this drug as a substitute for nitroglycerin and the nitrites, as it has a similar action, but of longer duration. It is ammonia in which 1 atom of H is replaced by HO. It is known only in aqueous solution as salts, of which the most common is the hydrochlorate; this occurs in odorless crystals which are freely soluble in water. It converts hemoglobin into methemoglobin, and is said to be a powerful antiseptic.

Iodoformin.—Eichengrün[2] claims that this substance, the composition of which is not given, contains 75% of iodoform in chemic combination. It is a fine, white, odorless powder which when exposed to light becomes light yellow without being chemically changed. It is insoluble by ordinary means, but may be used in gauze and cotton and in salves where there is no water. It may be sterilized at a high temperature. On contact with acids or alkaline fluids, as in wounds, iodoform is set free. The author has also another similar preparation, iodoformal, for which nearly the same properties are claimed.

The Pharmacology of the Ipecacuanha Alkaloids.—Wild[3] continues the examination of the two alkaloids, cephaëlin and emetin, begun by Paul and Cownly.[4] Cephaëlin is soluble in caustic alkalies, emetin is not; the latter is identical with the emetin formerly obtained by Glenard.[5] These alkaloids possess a definite composition, agreeing with the formula $C_{14}H_{20}NO_2$ for cephaëlin and $C_{15}H_{22}NO_2$ for emetin; the latter alkaloid is thus the methyl compound of the former, the chemic relations between them being similar to that existing between morphin and codein or between caffein and theobromin. In the experiments the hydrochlorids of the alkaloids were used. Both cephaëlin and emetin possessed a powerful emetic action; the emetic dose of the latter was, however, about double that of the former. In nonemetic doses the

[1] Quart. Med. Jour., July, 1895, from St. Bartholomew's Hosp. Rep., 1895.
[2] Wien. med. Blätter, No. 28, S. 442.
[3] Lancet, Nov. 23, 1895.
[4] Pharm. Jour., Aug. and Nov., 1894.
[5] Ann. de Chim. et de Phys., series 5, vol. viii. p. 233.

degree of nausea produced by cephaëlin was also about double that produced by emetin—*e. g.* the intensity and duration of the nausea following 5 mgm. of cephaëlin was much the same as that following 10 mgm. of emetin. Both alkaloids lowered the arterial tension, and little difference was apparent in small doses, but the depression produced by the emetic dose of cephaëlin was less than that produced by the larger dose of emetin; cephaëlin appeared, therefore, to be distinctly preferable where a nondepressing emetic was desired. Both alkaloids caused contraction of the blood-vessels after destruction of the brain and spinal cord, but emetin was distinctly more active than cephaëlin; 1 in 10,000 of the latter produced little if any effect, while 1 in 20,000 of emetin was followed by marked contraction. On the heart no appreciable difference could be made out; both produced slowing, weakening, and diastolic arrest of the isolated organ; recovery was easily effected when the poison was removed. It is doubtful whether the drugs in the doses administered to men would affect the heart directly; but the fact that 1 in 20,000 caused diastolic arrest in 46 minutes renders caution necessary in giving larger doses of the alkaloids. Both acted as muscle-poisons, but cephaëlin had the greater toxic power, and also caused irritation of the motor nerve-endings and contracture. Salivation was well marked wherever there was nausea. Emetin caused a flow of watery mucus from the nasal mucous membrane when a full dose was given; this was not noticed after cephaëlin. It is possible that the expectorant action of ipecacuanha is due to a similar action of emetin upon the other portions of the respiratory mucous membrane. Intestinal peristalsis and a loose motion at times followed the administration of either alkaloid; there was never any marked purgation. No effect was noticed upon the secretion of the skin or upon the amount of urine. Assuming the view that emetin is methylcephaëlin to be correct, it would seem that the chief effect of the addition of the CH_2 group was to markedly reduce the action of the compound upon the convulsive or vomiting center in the medulla, and also to diminish the irritating effect upon motor nerve-endings. The methyl compound had, on the other hand, a more powerful action as a local vasoconstrictor. The addition of the methyl group did not appear to affect the other actions of the alkaloid. With regard to therapeutic use, only accumulated clinical experience can determine their relative positions. It seems probable that in cephaëlin we have a powerful and certain emetic singularly free from depressing effects when given in doses of from 5 to 10 mgm. (from $\frac{1}{12}$ to $\frac{1}{6}$ gr.); its action, however, is too slow to prove of much service in cases of poisoning, but in all other cases where emesis is desired it appears well worthy of trial. In acute catarrhal and febrile conditions, as an expectorant, and for all uses of ipecacuanha where vomiting is not desired, emetin in small doses seems likely to prove of considerable value, and also as an emetic in larger doses of from 10 to 20 mgm. (from $\frac{1}{6}$ to $\frac{1}{3}$ gr.) when a more depressing action is required. The powerful local constricting effect upon blood-vessels may also prove useful in hyperemic and inflammatory conditions. The wide variations in the activity of the pharmacopeal preparations of ipe-

cacuanha may not unlikely be due to variations in the quantities and relative proportions of the alkaloids which they contain, and the use of the pure alkaloids may render one of our most valuable remedies of still greater service.

Iron.—Chittenden[1] discusses the question whether the iron contained in ordinary inorganic preparations is absorbed from the intestine and is utilized in the formation of hemoglobin. Kunkel's results, confirmed by Woltering, indicate that this is the case. Whether inorganic iron is as readily utilized by the body in the production of hemoglobin as organic iron, such as ferruginous nucleoalbumins, hematogens, etc., is a question not considered in Kunkel's work, but it is clear that the animal body can make use of inorganic iron in the absence of more favorable material to work with. Bunge's hypothesis, advanced at the recent Congress für innere Medizin at Munich, that the organic preparations of iron were not assimilated, and that the inorganic preparations were not even absorbed, but found in toto in the feces, is criticised by Reinert,[2] who refutes the startling conclusion that the results of treatment by iron must be referred to the domain of suggestion, and that a diet rich in iron, particularly meat, eggs, spinach, etc., should be substituted for the usual method of administration. Bunge's experiments with iron were all made on animals. Reinert says we should expect a difference in the absorption and assimilation of iron between healthy and chlorotic subjects, and he is not acquainted with an idiopathic chlorosis in the animals experimented on analogous to that in man. (Compare the *Year-Book* for 1896, p. 1043.)

DaCosta[3] has found iron administered hypodermically very useful in certain forms of anemia when a rapid effect was desired or when iron was not tolerated by the alimentary canal. After trying various preparations, the author concludes that the ferrous manganese citrate, made by Merck, gives the best results. The solutions are made thus: The crystals are powdered in a mortar and gradually dissolved in hot distilled water, gr. j of the crystals to ♏v of water. The usual dose for an adult is ♏xv, representing gr. iij of the compound salt. "The dose of iron for hypodermic use should not, to begin with, be more than $\frac{1}{2}$ of what is given by the mouth. It gets rapidly into the circulation. Rosenthal[4] injected 0.04 g. of the pyrophosphate in solution into his own thigh, and 30 minutes afterward found the iron present in the urine." The effect on the nervous system of iron used subcutaneously is described as a sense of strength and excitation, in some cases where large doses have been given amounting even to delirium. Of this the author has seen no instances, nor has fever followed its use except in 1 doubtful case, the history of which is given. "Iron should not be used in this form indiscriminately, but only where rapid action is needed, as after exhausting hemorrhages or in anemic persons with delicate digestion who cannot assimilate iron by the stomach at all, or in gastric ulcer where it is desirable to prescribe iron, or when iron given by the mouth constipates excessively, or when a decided action on the

[1] Therap. Gaz., Mar. 16, 1890, from Dietet. and Hyg. Gaz., Nov., 1895.
[2] Univ. Med. Mag., Jan., 1896, from Wien. med. Blätt., Apr. 25, 1895.
[3] Therap. Gaz., May 15, 1896. [4] Wien. med. Presse, Dec. 1, 1878.

nervous system is required, and one that shall be produced as quickly as possible." Rocci[1] claims that iron administered in this manner remains in the organism as an assimilable substance, producing hyperemia in various organs and tissues, favoring the absorption of edema in anemic patients, the destruction of old red blood-corpuscles, and the formation of new hematins. As the author says, if this be true, the effect of hypodermic injections will be much more lasting than that following other forms of administration.

Izal is one of the numerous preparations of cresol, such as creolin, lysol, solutol, solveol, trieresol, etc. All of these productions are said to be superior to phenol in antiseptic properties, and far less poisonous. According to Squibb,[2] izal has no disagreeable odor, is a nonirritant, and does not affect instruments. It makes a cloudy solution. Delépine[3] considers this substance one of the most deserving of the disinfectants and antiseptics which have been proposed of late years. Izal may be freely administered internally, used over extensive wounds, and injected under the skin without bad effects. Numerous experiments with the most important types of pathogenic bacteria under varying conditions were made, and it was found that, diluted with 100 or even 200 parts of water, it is a powerful and reliable antiseptic when contact of a sufficient length of time is secured.

Kosotoxin is the name given by Leichsenring[4] to one of the active principles of kousso- (koso-) flowers, which he has isolated from the ethereal extract of the latter. He found them to contain about $1\frac{1}{2}\%$ of this principle. Kosotoxin occurs as a yellowish-white powder which is readily soluble in alcohol, ether, chloroform, benzol, carbon disulphide, or acetone, but insoluble in water; it is soluble also in aqueous solutions of the alkaline carbonates; melting-point, 80° C. Its physiologic action has been investigated by Dr. Handmann,[5] who has found that the substance is a strong muscle-poison, while it has but little influence on the central nervous system.

Lycetal.—This drug, which is dimethyl piperazin tartrate, is said by Anthony[6] to have certain advantages as a solvent of uric acid over the alkaline salts of lithium, sodium, and potassium. The author asserts that it dissolves not only the outer layers of uric acid, but disintegrates and removes the albuminous nucleus. It is said to be more diuretic than piperazin because of its composition. The dose is from 15 to 45 gr. in aqueous solution. Six cases are briefly reported.

Malt-extracts.—The question so often asked, whether these proprietary articles, so much in vogue at present, have any medicinal value, has been partly answered by Emanuel.[7] It has been claimed that their chief value lay in the presence of diastase; this the author finds, after a careful examination of 6 of the most popular malt-extracts, to be absent, not even a trace being present.

[1] Sixth Italian Congress of International Medicine, Rome, Univ. Med. Jour., 1895, p. 366.
[2] Eph., Jan., 1896. [3] Ibid., from the Med. Chron., Manchester, vol. iii. p. 434.
[4] Am. Med.-Surg. Bull., Mar. 21, 1896, from Pharm. Zeit., 1896, vol. xli. p. 60. [5] Ibid.
[6] Am. Jour. Med. Sci., Mar., 1896, from the New Eng. Med. Monthly, 1895, No. 9, p. 417.
[7] Am. Jour. of Pharm., July, 1896.

The alcohol varied from 1.75 to 6%, and the conclusion reached is that they are nothing more than a strong beer. Elsner[1] says: "A good malt-extract should be able to convert its own weight of starch into sugar, at a temperature of 55° C., in not more than 15 minutes." According to an authority quoted by the author, beer should be a fermented infusion of hops and barley-malt. Good lager beer should have a specific gravity of 1.0159, and contain 3.5% of alcohol and 5.5% of extractive. The extractive consists of the soluble part of malt and hops, partly unchanged and partly converted into decomposition-products; among the former are maltose, gum, dextrin, peptone, hop resin, and alkaloidal substances; among the latter, glycerin and fatty acids. The malt-extracts examined contained from 2 to 3 times as much extractive as the specimen of beer examined at the same time, and it would seem that if clinical experience places any value on malt-extracts other than that which a strong beer possesses, it must be attributed to their presence.

Mercuroiodohemol.—The use of this drug as an alterative and hematinic is advocated by Mann.[2] It is an odorless brown powder insoluble in water. It is said to contain, besides hemol, 13% of metallic mercury and 28% of iodin. It is best given in pills, 2 or 3 gr. each, 3 times a day. The author has used the drug in various forms of syphilitic disease, and has found it to be a mild mercurial, the action of which is increased by the iodin, and of especial value in anemic and cachectic conditions. The symptoms of mercurialism were limited to slight swelling of the gums and diarrhea, which disappeared promptly on discontinuing the drug. In the great majority of cases mercuroiodohemol was given continuously with no ill effects.

Nosophen is prepared by Classen and Löb[3] by treating a solution of phenolphthalein with iodin. Its chemical name is tetraiodophenolphthalein. It is a pale yellow, odorless, and tasteless powder, insoluble in water and acids, slightly in alcohol, but readily soluble in ether, chloroform, and the alkalies, and contains about 60% of iodin. It is acid in reaction, and forms salts with many of the ordinary bases. Its bismuth-salt is known by the name of eudoxin, and the sodium salt by the name of antinosin. After numerous experiments with this substance, internally and hypodermically applied, no toxic effects were noticed. Seifert[4] of Würzburg reports that it has marked desiccating and antiseptic properties, and is useful as an insufflation in the treatment of acute coryza, chronic rhinitis with hypersecretion, balanitis, soft chancre, and eczema. It is especially adapted, from its comparative insolubility and freedom from odor, to the after-treatment of operations on the nose. It is said to prevent suppuration and the formation of adhesions after the application of the chemic or galvanocautery. It causes no irritation and no secretion in rhinitis sicca. The author states that it is more efficient in rhinitis hypersecretoria than bismuth, europhen, aristol, or sodium sozoiodolate. The sodium salt is soluble, and has been found to prevent the development of the

[1] Hülfsb. f. Chem., Apoth., u. Gesundheitsbeamt.
[2] Am. Med.-Surg. Bull., Apr. 18, 1896, from Med. Chron., 1896, iv. p. 346.
[3] Squibb's Eph., Jan., 1896. [4] Ibid.

anthrax-bacillus, staphylococcus, pyogenes aureus, and the diphtheria-bacillus within an hour. It has been used by Prof. Posner as an irrigation in cystitis in a 1% solution, but is not well borne in all cases. Eudoxin, the bismuth salt, has been used with some success by Rosenheim[1] in 26 cases of intestinal catarrh, principally chronic. Its good effects are attributed largely to its antifermentative action, and to the fact that it does not derange the stomach, even in dyspeptics.

Nicoulin.—The physiologic action of this substance, the formula of which is C_3H_4O, has been studied by Boinet.[2] It causes at first a period of excitation of the nervous centers, which are frequently congested. This short period of excitation is characterized by a temporary agitation, a few convulsive movements, acceleration of the respiration and of the heart's action, and meiosis in a very slight degree. These transient symptoms are especially marked in frogs, and are of variable duration according to the dose. If this was large, dulness, torpor, and stupor soon appeared, followed by paralysis of the muscles and sensation, disappearing later. With too large a dose death was preceded by a few convulsions. The mydriasis was marked in the last stage. The rectal temperature of the rat and of the guinea-pig fell to 86° and even to 77° F. The author says that the drug also caused secretory, respiratory, and cardiac symptoms which showed its predominant action on the bulb and its stupefying action on the nervous centers. The toxic doses varied. Nicoulin might cause death in doses of 0.062 gr. to 130 or 150 gr. of the animal's weight. If, however, the drug were administered in divided doses, of 0.031 gr. each, every 10 minutes, it would be eliminated in proportion to the dose taken. This fact led the author to make use of its stupefying and paralyzing properties in acute tetanus.

Nitroglycerin.—Mikhalkine has used this remedy successfully in sciatica where the usual remedies failed.[3] He claims that it has powerful antineuralgic properties. It is given in the following mixture: Alcoholic solution of trinitrin, 1%, 80 gr.; tinct. of capsicum, 120 gr.; peppermint-water, 240 gr. Five or ten drops to be taken 3 times a day. [That nitroglycerin may in some cases relieve sciatica is no doubt true, but that its pure and simple antineuralgic powers are great is a mistake.]

Nucleins.—Chittenden[4] gives a summary of the present knowledge of this subject. In the main, the opinions expressed are similar to those of Vaughan (*Year-Book* for 1896, p. 1051), and the advancement toward a more thorough acquaintance with the chemic properties of these complex bodies has not changed the clinical attitude of uncertainty. Chittenden divides nuclein bodies, provisionally, into 5 groups: 1. Nucleic acids, bodies rich in phosphorus, which contain no proteid matter, and yield on decomposition only phosphoric acid, nuclein bases, and sometimes carbohydrate bodies. They may occur free in some animal cells, as in spermatozooids, but are more generally united with more or less proteid matter. To this group may be added

[1] Squibb's Eph., Jan., 1896. [2] N. Y. Med. Jour., from Presse méd., Apr. 22, 1896.
[3] Squibb's Eph., Jan., 1896. [4] N. Y. Med. Jour., Apr. 11, 1896.

paranucleic acid, which, however, must have a widely different constitution, in that it does not yield any nuclein base on decomposition. 2. True nucleins, such as are present in cell-nuclei either as such or joined to proteid matter as a part of more complex molecules (nucleoproteids), containing variable amounts, as well as variable kinds, of nucleic acids, and yielding by decomposition proteid matter, nuclein bases, and phosphoric acid. 3. Paranucleins, obtainable especially from nucleoproteids with a low content of phosphorus, such as are present in the cytoplasm of the cell, in egg-yolk, and in milk. Paranucleins yield on decomposition proteid matter and phosphoric acid, but little or no nuclein bases—*i. e.* they are compounds of proteid matter with a small amount of paranucleic acid. 4. Nucleoproteids or nucleoalbumins, phosphorus containing proteids, widely distributed through all animal cells, which by digestion with pepsin acid yield soluble proteid products and true nuclein, the latter giving on further decomposition nuclein bases. 5. Paranucleoproteids, phosphorus-containing proteids, which by digestion with pepsin acid yield insoluble paranuclein, together with soluble proteoses and peptones.

The phosphorus so characteristic of all nucleins belongs to the contained nucleic acid, and may be taken as a measure of the content of nucleic acid. Further, a study of the cleavage-products of nucleic acid—as obtained from yeast, for example—shows that the peculiar nuclein bases formed in the decomposition of nucleins are likewise derived from the contained nucleic acid; hence we arrive at the conclusion that the typical element of all nucleins or nucleoproteids is the contained nucleic acid. Nucleic acid may be prepared from any form of nuclear material, preferably, however, from yeast-cells, as described by Vaughan;[1] it is an amorphous white powder of strong acid reaction, readily soluble in water containing a small amount of alkali; insoluble in alcohol and ether. From an alkaline solution it is not precipitated by excess of acetic acid, but is readily thrown down by a slight excess of hydrochloric acid, especially in the presence of alcohol.

Particularly noteworthy is the fact that nucleic acid in acid solution yields with albuminous bodies precipitates having the general character of nucleins. If we examine the composition of a few of the nucleoproteids and nucleins that have been separated from different tissues and organs, we gain a very clear idea of the great variation in the proportion of nucleic acid and proteid matter in these compound bodies. Thus, the peculiar nucleoproteid separated by Hammarsten from the pancreas contains 4.48% of phosphorus; the nucleus of yeast-cells Kossel found to contain about 6.19% of phosphorus; the nuclein of egg-yolk, according to Bunge, contains 5.19% of phosphorus; the peculiar nucleoproteid (nucleohiston) separated by Lilienfeld from the nucleus of lymphocytes contains 3.02% of phosphorus, while in the cytoplasm of leukocytes from the thymus and lymph-glands the same investigator found only 0.43% of phosphorus. Probably the great majority of the organs of the body contain nucleoproteids with a comparatively small percentage of phosphorus. The author gives the results of his examinations of 3 of the preparations

[1] Loc. cit.

on the market which are said to contain these substances. One, which is said to be made from thyreoid and thymus-glands, contains no phosphorus, therefore may be assumed to contain no nuclein. One form of a second preparation contains 1.25% of phosphorus, while another form of the same preparation contains only 0.22%. In a third preparation there was found a large percentage of phosphorus. As to the exact therapeutic action of nucleinic acids, nucleins, and nucleoproteids time and experience alone can determine.

Nutrose.—Bornstein [1] relates the results of his experiments with this sodium salt of casein, which may be thus summarized: 1. Nutrose is tasteless; 2. It does not irritate the intestine and is entirely absorbed; 3. It is completely utilized in the economy, and 4. It is not dearer than peptones, especially the Liebig's, with which the author compares it, and is much cheaper than somatose. These results substantiate the claims made by Salkowski [2] as a result of his experiments on dogs, that peptone preparations might well be replaced by casein.

Orthomonochlorphenol has been recommended by Munger [3] in atrophic and ulcerative rhinitis and eczema alæ nasi. The secretion and crusts were lessened promptly and excoriations healed kindly. A 25% solution was used in glycerol, but this should be applied by the physician only, and made fresh when needed. The drug is said to be useful in ulcerations of the septum and turbinated bones and in atrophic rhinitis. Berens [4] and Gleitsmann [5] speak of the anesthetic properties of this drug.

Parachlorphenol.—Girard [6] states that this product is crystalline at ordinary temperatures, has an odor similar to phenol, and is very soluble in alcohol and ether, though but slightly in distilled water, which takes up only 1.3%. With the addition of a small quantity of alcohol a 2% solution may be made. It coagulates albumin, as does phenol, but not completely. According to Karpow, in 2% solution it is a little less energetic than mercuric chlorid, 1:1000, against the spores of anthrax, but is incomparably more active than 5% solutions of phenol and cresol, and is much less poisonous than these substances. From the use of this antiseptic in about 200 operations the following conclusions are reached: In from 1 to 2% solutions it is the most energetic antiseptic which organic chemistry furnishes; it is of definite chemic combination, and in solution is almost colorless and with an odor less disagreeable than other phenol or cresol derivatives. It can be used for disinfection of the hands and instruments.

Paraldehyd in Asthma.—Hearder [7] calls attention to the antispasmodic action of this drug in asthma. He has used it, as he says, with good effects in about 30 cases, including ordinary spasmodic asthma, asthma with epilepsy, with heart-disease, with renal disease, with chronic bronchitis, and in 2 cases with pneumonia. In the majority of these cases relief was rapid

[1] Deutsch. med. Zeit., 1896, No. 51. [2] Berl. klin. Woch., 1894, No. 47.
[3] Am. Med.-Surg. Bull., May 16, 1896. [4] Ibid. [5] Ibid.
[6] Am. Jour. Med. Sci., Feb., 1896, from Rev. méd. de la Suisse Romande, 1895, No. 7, 365.
[7] N. Y. Med. Jour., Apr. 11, 1896, from Brit. Med. Jour., Mar. 21.

and complete, and in the remainder the distress was lessened. One dose was usually sufficient; a few patients needed a second dose, however, of from 30 to 45m an hour or so later. The hypnotic action of the drug is also of great service, as in so many cases the attack comes on in the evening or during the night. A point in dispensing is that the addition of a few drops of alcohol renders paraldehyd perfectly miscible with water. Any flavoring tincture may be used for this purpose.

A New Disinfectant from Petroleum.—Bartochevitch[1] writes of a product of the distillation of petroleum which remains as a residue after the separation of benzin, paraffin, vaselin, etc. It possesses strong antiseptic properties and is well adapted for disinfection. It is prepared in the following manner: To 100 parts of the residue of petroleum 20 parts, by volume, of concentrated sulphuric acid are added; the mixture is shaken, and left in a cool place for 24 hours. At the end of this time there is a blackish opalescent liquid, forming two-thirds of the original mixture, and a precipitate resembling tar. The liquid is decanted, and to it is gradually added a 10% solution of potassa. The quantity of the solution added should be somewhat less than that of the liquid taken. The mixture is shaken until a homogeneous yellowish-brown, soapy liquid is obtained. From this fluid a 5% emulsion may be made which has weakly antiseptic properties, and may be used for disinfecting rooms, wooden and metallic objects, etc. The author states that the concentrated fluid kills pathogenic bacteria in 40 minutes. If added in the proportion of 10% by weight to fecal matter, the odor is removed and disinfection accomplished. The advantages claimed by the author are the absence of odor, nontoxicity, and cheapness of production.

Phenacetin-poisoning with fatal result is so rare an occurrence that a case reported by Krönig[2] deserves notice: A printer's apprentice, aged 17, received 3 weeks before admission to the hospital 5 phenacetin powders of 15 gr. each. These were taken at intervals, not more than 2 on the same day, for occipital headache. When first seen there was unusual pallor, which the physician attributed to chronic lead-poisoning because of the patient's occupation. At the end of 3 weeks, as the pain was no better, the same prescription was repeated. A few hours after taking 1 powder there was frequent vomiting. Early the next morning the patient became extremely weak; the face and lips were bluish gray; the temperature 102°, the pulse weak; there were vomiting and diarrhea; the urine was of a chocolate color, the conjunctivæ subicteric, and the abdomen sensitive to pressure. There was pus in the right auditory canal. The icterus increased, as did the cyanosis of lips and extremities, until the skin became peculiarly yellowish-gray in color. The bladder emptied by catheter contained almost pure blood, the cells being disintegrated, forming microscopically coarsely granular masses. Although the patient was moribund, he was able to assert with positiveness that he had taken only phenacetin; one of the powders remaining proved on examination to consist

[1] Am. Med.-Surg. Bull., Apr. 18, 1896, from La Sem. méd., 1896, xvi. p. 18.

[2] Berl. klin. Woch., Nov. 18, 1895.

only of that drug. The diagnosis was phenacetin-poisoning with probable sepsis. The autopsy showed essentially universal methemoglobinemia. The examination of the blood was most thorough, and deserves extended notice. The author states that the appearance of the patient reminded him of a fatal case of potassium-chlorate-poisoning which he had seen recently, and the appearance of the blood strengthened the resemblance. There was an increase in the white cells and a solution of the red cells, a true erythrolysis; poikilocytosis was also present; some cells still contained hemoglobin which had lost its staining property. In other cells there was a varying degree of extraction of the hemoglobin. In the first stage the cells were swollen, and showed at one part a protrusion in which lay one or more small masses of hemoglobin; later the hemoglobin became finely granular, either diffused or in streaks occupying the edges of the cells. The hemoglobin escaped from the cells during these stages, and remained free in the blood-current, to be taken up later, presumably, by one of the large glandular organs (liver, kidneys, spleen), or to be excreted, or, as was frequently observed, to be absorbed by the white cells. The red cell itself shrank and remained as a clear cell-cadaver. As regenerative forms appeared nucleated red cells in the shape of normoblasts and megaloblasts. The author states that this condition was present also in the case of potassium-chlorate-poisoning mentioned above. All of the lesions found at the autopsy which contributed to the sudden and fatal termination must, in the opinion of the author, be attributed solely to the action of the phenacetin upon a subject whose powers of resistance were weakened by a low septic condition.

In the discussion following A. Fränkel mentioned 1 fatal case of phenacetin-poisoning that had come to his notice. Fürbringer had seen the symptoms of profound collapse follow a dose of 8 gr. of lactophenin. Aronson and Gerhard agreed with what had preceded, and added an emphatic warning against the careless and indiscriminate use of antipyretics of this class. The latest contributions to the literature of this subject may be found in "Die neueren Arzneimittel," Löbisch, 1895.

Phenylhydroxylamin-poisoning.—Hirsch and Edel[1] report the first case of poisoning by this body, which was produced last year, and has been recently examined by Lewin.[2] It is a product of nitrobenzol by reduction with tin; formula, C_6H_5NHOH. Lewin says: "I have examined most of the blood-poisons, and know of none that acts so quickly and in such small quantities as phenylhydroxylamin." In this instance poisoning followed absorption through the unbroken skin. A student in the laboratory spilled a quantity of the substance in alcoholic solution over his legs. This caused an intense burning pain, but no lesion of the epidermis except a brownish discoloration in places. In 20 minutes he became comatose, with extreme pallor and blue lips; he lost corneal and pupillary reflexes, and had an imperceptible pulse; respiration was deep and stertorous, but regular and not rapid. While the muscular tone as well as the skin-reflexes and tendon-reflexes were much

[1] Berl. klin. Woch., Oct. 14, 1895. [2] Arch. f. exp. Path. u. Pharm., Bd. xxxv.

diminished, the arms were held in tonic flexion. In 4 hours, after constant stimulation and venesection, followed by the subcutaneous injection of a liter of saline solution, the patient's condition was much improved, and after 7 hours consciousness returned. For the details of the examination of the blood and urine, which were made with great completeness, we must refer the reader to the original. The symptoms were similar to those following poisoning by nitrobenzol, yet they differed in some important respects.

Piperazin.—In addition to the testimony which continues to be added to that given last year, showing the inefficiency of this drug, a case is mentioned by Slaughter[1] in which, after the ingestion of 20 gr., the patient showed alarming symptoms of poisoning. There were cyanosis and semicoma; the pupils were minutely contracted; pulse and respiration slow and temperature slightly subnormal. Loss of motion was observed in both lower limbs; sensation was preserved. Recovery with free stimulation was complete, though slow.

Phosphorus-poisoning Treated with Potassium Permanganate.—Lanz[2] reports 12 cases treated by this method, which Antal[3] found efficacious in experiments on animals. The mortality in these cases was 5% higher than in 30 cases collected by v. Jaksch which were treated in the ordinary way. In 1 case which recovered after the ingestion of the heads of 10 packages of matches—the equivalent of 8 gr. of phosphorus—urobilin was found in the urine and feces, although it was absent from the urine in the first days. This agrees with the opinion of A. Riva, that urobilin and chromogen disappear from the urine and feces in severe phosphorus-poisoning, and that their reappearance indicates a good prognosis.

Phosphorism.—Magitot[4] gives this name to the symptom-complex resulting from phosphorus-poisoning at the state match-factories in France. All the workmen exposed to the fumes suffer without exception. The symptoms are partly common to all and in part special to those who are predisposed. The general symptoms are a cachectic condition, a subicteric color of the skin, a garlicky odor of the breath, the presence of phosphorus in the urine and saliva, wasting of the soft tissues, and the change in the chemic constitution of the bones. The special symptoms, depending on the predisposition of the individual, are chronic enteritis, with diarrhea, nephritis, cystitis, and bronchitis. Phosphorism is extremely persistent, continuing for a time after the exposure to the poison has ceased. This fact explains the tardy appearance of complications, and especially of necrosis. As long as the phenomena of phosphorism exist any operation for the removal of the necrosed bone will be followed by a return of the disease.

Potassium Permanganate in Opium-poisoning.—Sharp[5] summarizes the reports of the cases during the past year, and reaches conclusions very similar to those given in the *Year-Book* for 1896. If the permanganate is given immediately after the administration of the morphin, by the stomach or

[1] Med. News, Mar. 14, 1896.
[2] Berl. klin. Woch., Oct. 7, 1895.
[3] Ungar. Arch. f. intern. Med., i. 135, 1895.
[4] Therap. Gaz., Sept. 16, 1895.
[5] Ibid., Oct. 15, 1895.

hypodermically as a filtrate, it acts as an antidote. Improvement, especially in the respiration, was noted in animals experimented on, although the enormous doses of morphin necessary to destroy the lower animals made satisfactory experiments impossible, as the animals could not survive both drugs. The large majority of the cases reported are found by the author worthless, owing to a lack of care in the observations made during the treatment of the case. Callender's[1] case seems to be the only one reported in the abovementioned article where the permanganate was relied on, and where the evidence was strong that the patient's life was saved by its use.

Raw,[2] however, reports 3 cases of the successful treatment of opium-poisoning which offer striking evidence in favor of the use of potassium permanganate: Case 1.—M. G——, aged 27, had swallowed ʒij of laudanum. She was profoundly unconscious and evidently in the last stage of narcosis. Her stomach was at once washed out with a warm solution of Condy's fluid (ʒij to a pint of water) until the washings were quite colorless. She afterward was given ʒij of liquor potassii permanganatis every hour for 4 hours. Artificial respiration was kept up for 2 hours in addition. She made a good recovery. Case 2.—E. S——, aged 59, swallowed a large quantity of tinctura opii. She was comatose and could not be roused. The pupils were "pin-point," the respirations 6 a minute. Her stomach was at once washed out with a warm solution of Condy's fluid, and ʒij of liquor potassii permanganatis given every hour. In ¼ hour she showed improvement, and in an hour she was able to speak. She recovered. Case 3.—C. M——, aged 52, was admitted in a profoundly unconscious and comatose condition from opium and alcohol. Her stomach was at once washed out freely with Condy's fluid, and the effect was marvellous. In 10 minutes she was answering questions, and it was thought she had recovered; but she relapsed into a comatose condition, when potassium permanganate was given in ʒij doses every hour for 3 hours. The stomach was continually washed out with the solution until the washings were quite clear. This patient recovered.

Maynard[3] gives the results of the treatment of 19 cases by this method. His explanation of its mode of action seems rational. Moor advised the use of dilute sulphuric acid with the permanganate; this would substitute SO_4 for HO, on which the activity of morphin, according to Lauder Brunton, seems to depend. The permanganate oxidizes the morphin with which it comes in contact in the stomach, but not after absorption. The principal value of the method lies in the repeated washing out of the stomach, and in the fact that the decoloration of the solution (deoxidation) shows readily whether any opium remains to be removed. The mortality of the cases thus treated was 31.5%, as compared with 35% treated by other methods. The author states that this treatment was originally suggested by Dr. Barber Smith in 1884.

Pyoktanin-mercury is said by Dinkler[4] to have been used for the past

[1] N. Y. Med. Rec., vol. ii. p. 345.
[2] Brit. Med. Jour., July 13, 1895.
[3] Ibid., May 16, 1896.
[4] Pharm. Zeit., No. 89, 1896.

2 years in the government hospitals at Cairo and Port Said in chronic gonorrhea, favus, and gangrene with considerable success. Mixed with starch in equal parts, it is a cheap, unirritating, odorless substitute for iodoform. In gonorrhea a ½% watery solution was used; in favus, a ½% soap was applied twice a day and left to dry. Gauze is made as follows: 100 parts of ordinary gauze are saturated with a solution which contains 1 part of chlorid of mercury and 5 parts of chlorid of ammonium in 60 parts. Then this 1% dry bichlorid gauze is dipped in a ½% solution of pyoktanin and wrung out, which fixes the pyoktanin in the gauze. The deep-blue color is no drawback, but is said to be removable by washing.

Pyrantin, a new compound prepared by Prof. A. Piutti,[1] is described as a paraethoxylphenylsuccinimide, of the formula $(CH_2CO)_2.N.C_6H_4.OC_2H_5$. It is obtained by fusing either paraamidophenetol or phenacetin with succinic acid and extracting with boiling alcohol, when it is obtained in the form of colorless, prismatic needles, which melt at 155° C., soluble in 13.17 parts of water at 17° C. and in 83.6 parts of boiling water, insoluble in ether. Treated with hydrochloric acid or with melting potassium bisulphate, pyrantin is decomposed with succinic acid and paraphenetidin. Soluble pyrantin is the sodium salt of paraethoxylphenylsuccinamic acid. It is readily soluble in water and has the same physiologic action as pyrantin. Both preparations have been found to possess useful antipyretic properties. They lower the temperature of the body, it is claimed, 1° to 3° C., without affecting the blood, the heart, or the respiratory organs. Dr. Giovanni[2] recommends pyrantin, especially in fevers of a rheumatic nature, in daily doses of from 1 to 3 g.

The Action of Various Derivatives of Quinin on Infusoria.—Grethe[3] describes the results of a series of experiments on the paramecia. He found that the γ-phenylchinolin group was the most active agent, surpassing the action of quinin itself considerably. Phenylchinolin is derived from chinolin by the entrance of the phenyl group into its pyridin molecule. According to the place where this happens arise 3 isomeric bodies, called, α-, β-, and γ-phenylchinolin. The entrance of methyl gives γ-phenylchinolin; if to this be added methoxyl, OCH_3, or ethoxyl, OC_2H_5, there is formed γ-phenyl-p-methoxychinaldin or γ-phenyl-p-ethoxychinaldin; finally, there is γ-phenyltetrahydrochinolin; of these the γ-phenyl-p-methoxychinaldin is the most active, containing as it does the intensifying radicals methyl and methoxyl. All of this group, however, are far more active than quinin or any other of its derivatives; they are fatal instantly to the infusoria in strength of 1 : 1000. The author leaves the therapeutic application undecided, as the similarity of the paramecia to the malaria-parasite is too uncertain. Experiments, however, with these derivatives of quinin are very desirable. Tappeiner[4] continues the investigation of phenylchinolin on other of the lower organisms, and attains similar results, as shown by the following table:

[1] Am. Med.-Surg. Bull., Mar. 21, 1896, from Pharm. Zeit., xli. p. 71.
[2] Ibid.
[3] Deutsch. Arch. f. klin. Med., Oct. 25, 1895.
[4] Ibid., Dec. 13, 1895.

Paramecia killed by	1 : 1000.	1 : 5000.	1 : 10,000.	1 : 25,000.
(α) phenylchinolin . . .	1–2 minutes	8–10 minutes	10 minutes.	
(β) "	$\frac{1}{2}$ "	1–2 "	3 "	15–30 minutes.
(γ) "	1 "	2–3 "	3–4 "	4–6 hours.
Quinin	3–4 "	25–30 "	2 hours.	

Phosphin was examined in the same manner with results still more striking. The phosphin of commerce is a yellow coloring matter consisting essentially of amidophenylamidoacridin, $C_{19}H_{15}N_3$. Besides this, two new phosphins, methyl- and dimethylphosphin, were obtained from the dyeworks of Meister Lucius and Brüning at Höchst-a.-M. These three bases were used in the form of chlorids. The following table shows the results obtained:

Paramecia killed by	1 : 1000.	1 : 10,000.	1 : 25,000.	1 : 100,000.	1 : 200,000.	1 : 500,000.
Commercial phosphin .	Instantly	5 min.	20–25 min.	$1\frac{1}{4}$ hours	$1\frac{3}{4}$–2 hours.	
Methylphosphin . . .	"	1 "	7–9 "	$\frac{3}{4}$–$1\frac{1}{4}$ "	$1\frac{1}{4}$–$1\frac{1}{2}$ "	$1\frac{1}{2}$–$4\frac{1}{2}$ hours.
Dimethylphosphin . .	"	1 "	7–8 "	$\frac{3}{4}$–1 "	$1\frac{1}{4}$–$1\frac{1}{2}$ "	2–$4\frac{1}{2}$ "

Thus the action of phosphin on infusoria is much stronger than that of mercuric chlorid on bacteria. The superiority of phosphin over phenylchinolin must depend on the fact that it is a higher condensed benzol combination, and not on the presence of the amido group, as Grethe's results with amido- and acetamido-γ-phenylchinolin were much weaker than with phenylchinolin. Other protozoa gave results almost precisely similar; among these the ameba of the class of rhizopods was especially interesting because of its apparent similarity to the plasmodium malariæ. These substances act much less forcibly on bacteria and fungi, as does, in fact, quinin.

These investigations may be of importance in the therapeutics of malaria, as Binz[1] has drawn attention to the importance of the study of the infusoria and their susceptibility to quinin in relation to the nature of malaria. In a later communication Tappeiner[2] gives the results of experiments on animals with γ-phenylchinaldin, which was made in the form of a hydrochlorate by the chemical manufactory at Höchst-a.-M. It is easily soluble in water, and has a sharp, burning taste like pepper. Locally, in concentrated solution, it is irritating, but less so than orexin, for example. After absorption it was only slightly poisonous to rabbits in proportion of 1 g. to 1 kilo of weight. Methyl and dimethylphosphins had a similar action, but were more poisonous. Subcutaneous doses of 0.1–0.15 g. per kilo, especially of the methylphosphin, caused in guinea-pigs tetanic spasms, which, however, in spite of their long continuance, did not cause death. On the normal as well as on the artificially raised temperature these substances had little effect. Celli at Rome tried phenylchinaldin in 12 cases of malaria with very little effect. V. Ziemmsen gave in 1 case doses of from 9 to 12 gr. repeatedly, which, although modifying

[1] Centralbl. f. d. Med. Wissen., 1867, S. 308. [2] Münch. med. Woch. Jan. 7, 1896.

the fever somewhat and twice aborting the paroxysms, did not control its course, and had to be followed by quinin.

Quinin-poisoning.—A remarkable case is reported by Roberts[1] from the ingestion of 6 dr. of the sulphate. The patient was found almost immediately afterward in a state of collapse; the temperature was 95° F.; respiration almost imperceptible, shallow, and slow; the pulse 45, thin and small. Recovery from this condition was unexpectedly rapid; in 24 hours there remained only a slight deafness, which disappeared within a week, and amaurosis, which lasted for 2 weeks; after months there still remained blurred vision for near objects, and dyschromatopsia, yellow and red being best seen. For the first week the retina was hazy and the edges of the papilla blurred; after that the usual pallor of the disk and contraction of the vessels came on, and remained with only slight improvement as long as the patient was under observation.

Salicylic Acid.—Vineberg, Schuchart, and Binz[2] assert that experimentation on animals and observation of cases show that salicylic acid and its salts act energetically as oxytocics and emmenagogues, thus providing another resource in scanty menstruation and amenorrhea, but, on the other hand, these drugs must be given with great caution to pregnant women.

Sodium Salicylate and Uric Acid.—Bohland[3] states that salicylate of sodium produces an increased excretion of uric acid only when there is an increased production of this body. According to Horbaczewski, uric acid is the metabolic product of nuclein, which latter is chiefly derived from the white blood-cells. The author's investigations with Hecken were carried out upon 2 healthy men. It was found that sodium salicylate considerably increased the excretion of uric acid, but that the number of leukocytes was also greatly increased. Thus, medium doses of salicylates produce a distinct increase in the white blood-cells, and, if Horbaczewski's theory is correct, a considerable leukolysis, and through this latter an augmented uric-acid excretion. According to the above experimental evidence, it is hardly to be expected that the salicylates should be of use in gout, and the author believes they should not be used, even as analgesics, either in gout or in the uric-acid diathesis. [The conclusions of this author are of interest, and especially so in view of the great reliance placed upon sodium salicylate in the treatment of lithemia by Haig.]

Sanoform is recommended as a substitute for iodoform. It was first produced by Gallinek[4] in 1895, by the action of iodin on oil of winter-green, and is said to contain $62\frac{7}{10}\%$ of iodin. It is a white powder, soluble in 10 parts of hot alcohol, very soluble in ether, also in vaselin; it melts at 110° and is odorless. Langaard states that the substance is nontoxic and apparently nonirritating. It is stable, not being affected by light or heat, which makes it possible to sterilize it, so giving it an advantage over iodoform. Experiments seem to show that sanoform has properties of desiccation, as it forms an ad-

[1] Therap. Gaz., Sept. 16, 1895, from the Indian Med. Gaz., Apr., 1895.
[2] Quart. Med. Jour., July, 1895, from Gaz. de Gynéc., Dec., 1894.
[3] Therap. Gaz., May 15, from Centralbl. f. innere Med., Jan. 18, 1896.
[4] Notes on New Remedies, June, 1896.

herent tissue with the secretion of wounds. Its chemic name is diiodomethyl salicylate.

Senega-root.—It has been noticed that a distinct odor of oil of wintergreen has been present in this drug, and it has been suspected that this was due to adulteration. Goldener[1] shows that under certain conditions many plants of the natural order Polygalaceæ afford methyl salicylate, and that the suspected adulterant is a natural constituent of the root. The Swiss Pharmacopœia has adopted the test for salicylic acid in the ether extract of senega-root to identify it as the true root.

Oil of sesamum has been subjected to thorough clinical examination, and the results indicate that it is a valuable article of food and a substitute for ol. morrhuæ. It is without odor and almost tasteless, and does not easily become rancid. Stüve[2] has observed its action in several hundred cases of phthisis and wasting diseases of all kinds and in all ages. He says that among these cases, which included many who could not tolerate cod-liver oil, there were very few, less than 10 in all, who suffered from eructations or nausea, or very rarely diarrhœa, in which cases it had to be discontinued. The nutrition improved, especially in chronic colitis with constipation and increased production of mucus, when fat as an article of diet had been avoided and the nutrition had suffered in consequence, and the action on the bowels was noticeably good. In the emaciated sufferers with chronic gastritis, nervous dyspepsia, ulcer of the stomach, etc. 2 to 4 teaspoonfuls or more of the oil were given daily without any discomfort and with excellent results. The belief is said by v. Noorden to be an error that fat is badly borne in diseases of the stomach; it is necessary, however, that the form of fat should be chosen and administered with care. In many febrile conditions oil of sesamum was given with success; also in more than 200 poorly-nourished and cachectic children, with only 1 instance where it was not tolerated. Cod-liver oil is believed to be more readily absorbed than any other fat. Bucheim attributed this to the free fatty acids which it possessed, and lipanin has been recommended on this hypothesis, as it is composed of pure olive oil with the addition of 4–6% of oleic acid. Blumenfeld[3] has proved that the presence of a free acid does not aid the absorption of fat, and the author in a series of experiments shows that oil of sesamum, which contains no free acid, is readily absorbed in large quantities. It is well adapted for subcutaneous injection according to v. Leube's method, if that method should come into general use.[4] It is not absorbed from the rectum, nearly the entire quantity having been rejected after 12–24 hours' retention in the bowel. An important advantage of the oil of sesamum is its cheapness, but a good quality is very essential. There are said to be numerous brands in the market, and the quality has in general improved, owing to its increased use in commerce.

Metallic Silver and Silver Lactate and Citrate.—Credé[5] gives

[1] Squibb's Eph., Jan., 1896.
[2] Berl. klin Woch., Mar. 16, 1896.
[3] Zeit. f. klin. Med., xxviii., 1895.
[4] Congress f. innere Med., 1895.
[5] N. Y. Med. Jour., Apr. 25, 1896, from Deutsch. med. Zeit., Mar. 26, 1896.

the results of his investigations of silver and some of its salts as antiseptics. He has satisfied himself metallic silver when brought into contact with colonies of schizomycetes kills them, without exerting any action on the animal tissues. So it may be remarked that the late Dr. Marion Sims's choice of silver wire as a material for sutures was a happier one than could be realized at the time. Credé says that aseptic wounds coated with silver-foil remain aseptic for weeks, and heal better than with any other dressing. Instead of silver-foil, he has lately employed a dressing material made by Max Arnold of Chemnitz, in the fabric of which metallic silver is intimately blended in such a manner as to admit of its being cut or torn into any shape desired. There is also a dressing in the form of a mull containing powdered silver that may with advantage be substituted for iodoform-gauze in packing deep wounds. Numerous experiments have shown that silver forms a lactate with the lactic acid produced in the metabolism of the microorganisms, and this compound kills them; therefore it occurred to Credé to make direct use of silver lactate instead of silver in the metallic state. This preparation, known by the trade name of actol or aktol, he thinks fulfils all the requirements of an antiseptic better than any other. He has given as much as 15 gr. of it subcutaneously without the least bad effect; there was only a slight burning pain at the site of injection, lasting a few minutes. Silver lactate forms no insoluble compounds with the alkaline secretion of a wound or with tissue-juices, as, for example, mercuric chlorid does, but only soluble ones, which gradually permeate the tissues and thus extend their action to some distance from the surface. Silver citrate, however, seems to be quite as efficient, and to be free from some minor disadvantages, which are not specified, of the lactate. The citrate has the trade name of itrol. Credé says it is a perfectly harmless antiseptic and an excellent dusting powder for wounds. In the course of 4 months he has treated many hundreds of wounds with it, with not the least untoward effect. From another source[1] we learn that the lactate or actol is irritating to mucous membranes, and is easily decomposed by the action of light. Itrol is said to be free from these disadvantages, yet has the same marked antiseptic properties.

The Direct Influence of Sodium Bicarbonate on the Gastric Secretion.—In view of the uncertain teaching as to the effects produced on the gastric mucous membrane by the alkalies, Reichmann[2] made a series of experiments which may be summarized: Patients drank before breakfast, during successive mornings, alternately 200 c.cm. of a bicarbonate solution. After 15 to 30 minutes the gastric contents were aspirated, but neither small nor large doses appeared to influence the quantity of fluid secreted. The same experiment was tried in subjects who, however, were allowed shortly after drinking to eat a breakfast. Here, again, the results of aspiration were negative. In the next place, the alkali was administered every morning during several weeks, but no appreciable effect was produced. On the other hand,

[1] Notes on New Remedies, June, 1896

[2] Therap. Monatsh., Mar., 1894; Brit. Med. Jour., July 6, 1895.

when taken after food the acidity of the gastric contents was diminished in proportion to the amount of bicarbonate taken. Again, this mode of investigation when continued over several weeks produced no effect on the gastric secretion. In conclusion, the author states that the examinations numbered 103; that the drug will act as an alkali even to a considerable degree, but that it in no way influences the secretory power of the stomach. Nevertheless, he admits the value of a drug which is capable of lessening acidity, and he states that the long-continued use of weak alkalies will no doubt produce a tonic effect on a weak gastric mucous membrane. [These experiments are certainly of interest, and, if confirmed, will compel us to alter our long-held views of the efficacy of alkalies as peptic stimulants when given to the fasting.]

Solanum Paniculatum.[1]—The root of this plant is said to be used in Brazil, where it grows, as a purgative; also in diseases of the liver and spleen as an alterative, tonic, and drastic. Kobert, who experimented with it, found it inert, while Michaelis thinks it is a stomachic and useful in biliary colic and in chronic dyspepsia. He gives 15 drops of a fluid extract 3 times a day.

Somatose as a Galactagogue.—Drews[2] gives a number of cases in which the use of this agent, in which the albuminoids and nutritive constituents of flesh are converted into soluble albumoses, 5 parts of somatose representing 30 parts of beef in nutritive value, was of value to increase the secretion of milk. He asserts that in all cases in which an abundant secretion of milk does not take place, or in which it shows a tendency to cease too early, somatose should be employed before giving the child over to the dangers of artificial feeding. The proper dose for this purpose is a teaspoonful 3 or 4 times a day in warm milk, cocoa, or soup. On account of the almost complete absence of taste somatose is nearly always well borne even for long periods.

Stearates of the Alkaloids.—This combination has been recommended by Zanardi[3] to facilitate the solution of alkaloids in the fats and oils, to increase their efficacy when applied externally or in the form of suppositories.

1. *Morphin stearate*, $C_{17}H_{19}NO_{31}.C_{17}H_{35}COOH$, is obtained either by the direct action of stearic acid upon morphin or by double decomposition. To prepare it by the first method molecular proportions of stearic acid (5.08) and morphin (5.72) are taken. The stearic acid is slowly heated in a glass retort with 100 c.c. of absolute alcohol until dissolved, the morphin being then added in small portions. The warm solution is filtered, and on cooling will deposit morphin stearate. The mother-liquor, if evaporated, will deposit more crystals. If an absolutely neutral morphin stearate is desired, double decomposition between sodium stearate and morphin hydrochlorate must be resorted to. The sodium stearate is first prepared by heating 20 c.c. of normal soda solution (0.8 sodium hydrate) and 5.68 g. of stearic acid together with 50 g. of distilled water. To the solution thus obtained a solution of 7.51 g. of morphin hydrochlorate in 100 g. of water is added. The mixture is stirred, and the morphin

[1] Med. Chir. Centralb., Apr. 24, 1896.

[2] N. Y. Med. Jour., June 27, 1896, from Centralbl. f. innere Med., June 6, 1896.

[3] Am. Med.-Surg. Jour., May 16, 1896, from Boll. Chir.-farm., 1896, No. 4.

stearate deposits in the form of a white, voluminous precipitate. The latter is thrown on a filter and washed with water until the washings are no longer rendered turbid by hydrochloric acid, or, after the addition of nitric acid, by silver nitrate. This purified stearate is then dried and crystallized from alcohol. Morphin stearate thus obtained occurs in the form of white, crystalline, brilliant scales of a greasy touch. It melts at 84° to 86° C., decomposing at 100° C., and chars at 150° C. It is almost insoluble in water, soluble in ether and in cold alcohol, and very freely so in hot alcohol; sparingly soluble in petroleum, ether, benzin, chloroform, or oil of turpentine. At ordinary temperatures it dissolves in oils in the proportion of 1 : 100, and is also soluble in fats and in vaselin. The presence of stearic acid in morphin stearate is detected by cupric sulphate, while morphin is shown by nitric acid or the other known reagents for it. Morphin stearate contains 50.17% of morphin, and is employed in preparing morphinated oils, ointments, and suppositories.

2. *Atropin stearate*, $C_{17}H_{23}NO_3.C_{17}H_{35}COOH$, is obtained by the same processes as morphin stearate. It crystallizes in fine white, brilliant needles, greasy to the touch, melting at 120° C., and beginning to decompose at 170° C. It behaves toward solvents just like morphin stearate. It contains 50.43% of atropin. Stearic acid is detected by floating the stearate on water and treating with a solution of cupric sulphate; atropin, by first dissolving it out by the aid of tartaric acid and applying the usual reagents. The 1 : 500 solution of stearate of atropin in almond oil is considered an excellent substitute for oil of hyoscyamus or oil of belladonna. The stearate is dissolved in the oil with the aid of gentle heat. Extract of belladonna may be advantageously replaced in ointments and suppositories by atropin stearate.

3. *Cocain stearate* is prepared in the same way as the foregoing stearates. Take 3.03 g. of cocain and 2.84 g. of stearic acid. Its formula is $C_{17}H_{21}NO_4.C_{17}H_{35}COOH$. It crystallizes in white, brilliant needles, joined in bundles. It melts at about 90° C., and contains 51.63% of cocain. Toward solvents it behaves similarly to the foregoing stearates. Stearic acid is detected as before, while the cocain is shown by first treating with tartaric acid to liberate it from its combination, and then applying the usual reagents.

Stypticin as a Hemostatic.—Gottschalk[1] has used this new hemostatic, which is obtained by the oxidation of narcotin, in 47 cases of uterine hemorrhage. It may be given hypodermically or by the mouth in doses of $\frac{3}{4}$ gr., repeated 5 or 6 times a day. It is said to have a local and general sedative action, and for this reason to be preferable to hydrastis in dysmenorrhea. The author claims that stypticin promptly checks hemorrhage due to uterine subinvolution. In fungous endometritis it is useful after curettage, and in hemorrhage due to fibroids or the climacteric. In congestive menorrhagia it may be combined with hydrastin. It is said to stimulate uterine contraction, therefore would be contraindicated in threatened abortions. It has little influence on the bleeding of uterine polypi. In profuse menstruation the remedy is best given 5 times daily for 4 days before the expected period.

[1] Am. Med.-Surg. Bull., Feb. 29, 1896, from Brit. Med. Jour., No. 1828, p. 7.

Sulfonal.—Andrews[1] states that this drug has a valuable antispasmodic action. He has used it in painful muscular spasm after fractures of the thigh, and finds that its action is more sedative than the opiates. Some cases of persistent hiccough are stopped by it; it has also been used with good effect in the treatment of nocturnal emission of semen. Shaw-Mackenzie[2] recommends it as a very useful remedy in railway-sickness and sea-sickness. After numerous observations he concludes that antipyrin, phenacetin, the bromids, and chloral do not give as good results in this class of cases as sulfonal. The dose need not exceed 10 or 15 gr., and no depression or other ill effects are noted.

Influence of Certain Groupings on the Physiologic Action of Synthetic Remedies.—In an interesting paper read at the last annual meeting of the Maryland Pharmaceutical Association, Coblentz[3] says: "There is but little doubt that a relationship between chemical constitution and medicinal action exists to a certain extent. This is evidently subject to certain conditions. Most important among these may be mentioned the intramolecular structural arrangement; the degree of solubility which regulates the more rapid or slower absorption in the system; various decompositions which these bodies undergo after entering the body; and the electrolytic conductivity of the compound." As an illustration of the last-mentioned condition the relation between the salts of potassium, sodium, and rubidium is given. "The electrolytic conductivity of the iodids of these metals shows an ascending progression similar to that of the molecular weights. Thus—Dilution 32:

Element.	*Na.*	*K.*	*Rb.*
Molecular weight	23	39	85.4
Elect. cond. of iodids	105.7	128.5	130.6

These data are said by Erdmann not only to represent the actual and relative rapidity with which the iodids are distributed throughout the organism under the influence of osmotic pressure and electric currents, but the data also afford a measure of their degree of medicinal activity, for physiologic activity is conditioned by the ability to enter into chemic reactions, and, according to Ostwalt's law, chemic activity is proportional to the electrolytic conductivity. This explains why the practitioner prefers potassium iodid to the sodium salt, although the latter contains 85% iodin compared to 76% of the former; also, upon these grounds, rubidium iodid, containing about 60% iodin, is receiving attention, as it is claimed to be far more active than either of the other iodids."

The alkaloids, hypnotics, and antipyretics are considered as to their composition and action. It would be beyond the limits of this department to quote more fully, but a knowledge of the chemistry of these synthetic products, which are being manufactured in such quantities, seems an important complement to their clinical observation. Boyer[4] discusses this subject at some length, calling attention to the extensive and rapid development of the manufacture of synthetic remedies. He says: "A medical man can almost foresee the probable value of new compounds if he will but view them from a

[1] Squibb's Eph., Jan., 1896.
[2] Ibid.
[3] Druggists' Circ. and Chem. Gaz., June, 1896.
[4] Therap. Gaz., July 15, 1895.

chemical-medical standpoint." [This statement may be varied slightly in saying that their dangers may also be foreseen, which would be a still more important gain, judging from the numerous instances of the careless use of these new remedies with which current medical literature abounds.]

Taka Diastase.—Lascar,[1] in a paper discussing the subject of the digestion of starches, describes this extract of malt, the discovery of Mr. Takamine, a Japanese chemist. It is a dry powder, capable of converting more than 100 times its weight of starch into a soluble state, the process being completed in 4 minutes. The author states that with the best malt-extract between 7 and 8 minutes were required to convert its own weight of starch into a soluble form. Taka diastase is tasteless and odorless, and can be given in very small bulk. The dose is from 1 to 5 gr.

Tannalbin.—Gottlieb[2] and Engel[3] report their observations on a new preparation of tannin. The former describes tannalbin as a slightly yellowish, tasteless powder containing 50% of tannin, made by subjecting a compound of tannin and albumin to a heat of from 212° to 248° F. for 5 or 6 hours, whereby it acquires the property of resisting gastric digestion, while it still remains susceptible to the slow action of the intestinal juices. Von Engel has tried it in 40 cases. He reports that he has observed no harm from its use. The dose for adults is 15 gr., that for children half that amount, from 2 to 4 times a day. He found it serviceable in all diarrheal affections in which an astringent is indicated, especially chronic intestinal catarrh. It proved efficient in 25 out of 29 subacute or chronic cases, and in 9 out of 10 acute ones. Vierordt[4] substantiates the claims made for this drug in acute and chronic diarrhea. It is given to adults in doses of 8 to 15 gr. 4 times daily.

Tannigen has been used by Munger[5] in cases of hypertrophic rhinitis and chronic nasal pharyngitis. It may be used as an alcoholic solution in the strength of a dram to the ounce. The pure drug proved too strong; sometimes the solution was made weaker than this, but it did not prove as satisfactory in its results as was hoped, and seemed to act as a stimulant rather than as an astringent.

Theobromin Salicylate.—The shortcomings of diuretin are such as to lessen its usefulness—its instability in the atmosphere—since the carbon-dioxid withdraws a portion of the theobromin from its salicylic-acid combination; its alkaline reaction; and its sweetish taste. Theobromin salicylate is said[6] to be free from these drawbacks. It is a definite chemical salt of the formula $C_7H_8N_4O_2COOC_6HOH$, occurring as small white needles, acid in reaction, of an agreeable bitter taste, and but slightly soluble in water. The dose and the uses of this salt are the same as those of diuretin.

Traumaticin is not new by any means, and it has already had an extended use for certain purposes. It is therefore instructive to learn of the most advan-

[1] Therap. Gaz., July 15, 1895.

[2] N. Y. Med. Rec., Apr. 18, 1896, from Deutsch. med. Woch., Mar. 12. [3] Ibid.

[4] Deutsch. med. Woch., 1896, No. 25. [5] Am. Med.-Surg. Bull., May 16, 1896.

[6] Ibid., Mar. 7, 1896, from Bericht über das Jahr 1895.

tageous method of preparing it.[1] Traumaticin is a saturated solution of gutta-percha in chloroform; it is best prepared as follows: The lightest-colored gutta-percha procurable is cut into small pieces and macerated with 12 or 15 times its weight of pure chloroform for 24 hours, with frequent agitation. The mixture is then transferred to a retort and about $\frac{2}{3}$ of the chloroform distilled off over a water-bath. The traumaticin thus obtained is a thick, homogeneous liquid, to which the requisite medicament may be added.

Trional.—Berger[2] reports a case of acute poisoning after the ingestion of 1 dram daily for 3 days. The patient was ataxic before the administration of the trional, and had also the opium-habit, for which he was being treated. The ataxia increased; delirium, difficulty in speaking, and at times Cheyne-Stokes respiration were present. The urine was red, but clear, containing no albumin or sugar. The blood was unchanged. The somnolence lasted 4 days, the other nervous symptoms 4 days more. The urine remained wine-colored for more than 2 weeks. [The author's opinion as to dosage corresponds with those given in the *Year-Book* for 1896, p. 1060.] Reinicke[3] states that 3 cases of poisoning have been reported, 2 of which ended fatally. In a fourth case, in which the drug was given in moderate doses, 15 gr. every second day, there occurred nausea, diarrhea, and cardiac weakness; the urine contained albumin and casts, with a few blood-cells. The patient recovered gradually, but was left in a weak and anemic condition. The writer says it remains to be seen whether, even when trional is used with the utmost caution, there is security from ill effects, and that in this respect it does not differ from others of the newer hypnotics.

Treatment of Renal Deposits of Uric Acid.—Klemperer[4] in a review of this subject says that a solution of the calculus by medical means is not to be hoped for; the treatment of calculi is therefore surgical. The prophylaxis, however, is of even greater importance. Precipitates are formed when the solution is too concentrated; this is to be avoided by drinking a large quantity of water, and at the same time diminishing as much as possible its excretion by other channels. The author says, further: We know that the uric acid is not an insufficiently oxidized urea, but that it comes directly from the phosphorus-holding albumin, the nuclein; the diet must then be so arranged as to diminish the albumin-containing nuclein without reducing other albumins. Milk, egg-albumen, and vegetable albumen are desirable, while meat is to be avoided. The thymus-gland contains the most nuclein; then follow the liver, kidney, brain. In this question individual differences are often important. "The less nucleoproteid taken, the less uric acid produced," may be true for all, but "the more nucleoproteid, the more uric acid," is not necessarily true, as in some cases the nucleoproteid may be converted to urea. Coffee and its related products are said to produce uric acid. Over-exertion may have the same effect. Among numerous more or less efficient drugs

[1] Squibb's Eph., 1896, from Pharm. Jour. and Trans., vol. xxv. p. 1024.

[2] Münch. med. Woch., Oct. 1, 1895. [3] Boston M. and S. Jour., July 11, 1895.

[4] Münch. med. Woch., June 30, 1896.

which influence the reaction of the urine and its uric-acid content, the author mentions as most useful urea, which, according to Rüdel,[1] dissolves uric acid and increases diuresis. It may be given in daily doses of 5 dr.

Uricedin.—Meisels[2] finds that uricedin, which has great similarity to Cantani's powder and consists of sodium citrate, sodium chlorid, and lithium citrate, is inefficient to dissolve uric acid or to prevent its precipitation in the tissues. [This is less favorable than Langstein's report of last year (*Year-Book* for 1896, p. 1075), but a brief life has been the lot of all the vaunted solvents of uric acid thus far; in fact, the treatment of the uric-acid diathesis is on a basis no more rational than it was last year. Piperazin has ceased to find favor; nothing concerning lysidin (see *Year-Book* for 1896, p. 1047) has been reported this year. The theory of Horbaczewski is opposed by Ritter,[3] although assumed by Klemperer and Bohland (vide supra) in their discussions of the subject. The present state of uncertainty in which we rest with regard to the function and fate of the nucleins makes a solution of the question impossible for the moment.]

Urotropin, or **hexamethylenetetramin,** is recommended by Nicolaier[4] as a diuretic and solvent for uric-acid concretions. During its use the urine remains acid; even in 2 cases of cystitis, with strongly ammoniacal urine, the fermentation in the bladder ceased with doses of from 8 to 24 gr. daily. Urotropin seems to be absorbed unchanged. The author has detected it in the urine by means of bromin-water, with which it forms an orange-yellow precipitate of urotropin dibromid 15 minutes after administration. A single dose of 8 gr. required 13 hours for elimination, a dose of 16 gr. 27 hours. The drug may be given in 30-gr. doses daily without discomfort; 90 gr. a day, continued for some time, have caused slight symptoms of vesical and renal irritation.

Valerianate of amyl is said to give good results in cases of bilious colic,[5] not only as a sedative, but by aiding in the expulsion of the calculus. It does not act so well in nephritic colic. The dose is 2 or 3 gr. in capsule 2 or 3 times a day.

[1] Münch. med. Woch., June 30, 1896.

[2] Wien. med. Woch., Sept. 29, 1894. [3] Ibid., p. 83.

[4] Am. Med.-Surg. Bull., Oct. 1, 1895, from Deutsch. med. Woch., 1895, xxi. p. 541.

[5] Univ. Mag., Sept., 1895.

ANATOMY.

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Anatomic Nomenclature.—At its meeting in May, 1895, the German Association of Anatomists adopted the nomenclature proposed by a committee of that society. This committee, consisting of several of the most distinguished German anatomists, aided at various times by anatomists of other nations, after years of labor have suggested a nomenclature which it is hoped will be universally used.

Descriptive and topographic anatomy were alone considered, no changes having been made in the terms applied to the minute structures. Only the Latin names were determined, it being left to the different nations to translate the terms into their own languages.

The following general principles have been adhered to: Each part is to have but a single name, which is to be in Latin and is to be philologically and orthographically correct. The names are to be as short and simple as possible, and shall not attempt to describe or "interpret" organs.

Compound names are to be formed with as much uniformity as possible, though some very firmly-rooted names, as sternocleidomastoid, are allowed to remain unchanged. Some of the personal names applied to organs and parts have been retained, others abolished; in the future further changes may perhaps be made in these names. Names which have been applied to various parts in recent years in the domain of the specialties are to be largely retained, for it is deemed wise that the student should learn those terms in his early years of medical study which he will subsequently find in use when he reaches the clinical and practical portion of his medical course.

Terms lacking in clearness and those used in different senses by different writers have been eliminated and new ones applied. As examples may be given the following names, used in the description of the lung (pulmo-): *Basis pulmonis, apex pulmonis, sulcus subclavius, facies costalis, facies mediastinalis, facies diaphragmatica, margo anterior, rami bronchiales, ductuli alveolares, etc.*

As names of some of the branches of the nervus medianus the following are given: *Ramus palmaris n. mediani; ramus anastomoticus cum n. ulnari; nn. digitales volares communes.*

Some terms used in topographic anatomy: *Regiones colli, regio colli anterior, regio submentalis, hyoidea, laryngea, fossa jugularis, etc.; trigonum omoclaviculare, regio nucha, etc.*

V. Bardeleben,[1] from whose article the above facts are mostly taken, expresses the hope that the new nomenclature, which has required much labor, time, and money in its preparation, will be used in the future, not only by anatomists, investigators, and teachers of the various nations, but also by physiologists, pathologists, and by the practising physicians; thus only will the protracted and difficult work of the committee of revision be of value.

The new nomenclature is being introduced in the extensive "Handbuch der Anatomie des Menschen," edited by Karl v. Bardeleben. The atlases of Toldt and Spalteholtz also employ the new terms, and the Berlin Laryngological Society has recently adopted it.

Prof. His[2] gives a full list of the new terms.

Röntgen Rays.—As the Röntgen photography is yet in its infancy, it is difficult to state what advantages will accrue to anatomy from its use; further changes and improvements will doubtless promote and extend anatomic research. In the study of the osseous structures and of the topographic anatomy of the skeleton it will probably prove to be useful. Salvioni[3] and others have published articles showing, among other things, the relations of the carpal bones, etc. Chapin and Morton[4] publish a skiagraph of a marasmic infant, showing particularly the osseous structures and the extent to which ossification had advanced. A modification of the Röntgen process by means of an apparatus called the "photofluoroscope" has been devised by Bleyer[5] and may perhaps be of use in anatomical studies. Braus[6] has made photographs of the arteries of the hand which had been injected with mercury. He gives the technic of the method. The Röntgen rays can also be made use of in the study of the lymphatics.[7]

OSTEOLOGY.

Obliquity of the Forearm.—Potter[8] has investigated the degree of obliquity of the forearm to the arm in the male and female. In 90 females the angle of obliquity was found to be 167.35°; in 95 males the angle was 173.17°. Thus the forearm is shown to be markedly more oblique in the female than in the male. Potter further shows "that there is no deviation inward of the forearm during flexion in the upper extremity of either sex." [This may perhaps be of interest surgically, as after certain fractures about the elbow the angle of obliquity is often changed, and the carrying function of the arm, as it has been called by Allis, is interfered with; the normal differences in the two sexes should then be considered in estimating the amount of deformity.]

[1] Deutsch. med. Woch., No. 27, 1895.

[2] Arch. f. Anat. u. Phys., Anat. Abth., Suppl. Bd., 1895.

[3] Rendiconti del Accad. Med.-Chir. di Perugia, vol. viii. No. 2, and Nature, vol. liii. No. 1375.

[4] N. Y. Med. Jour., Apr. 25, 1896, and Apr. 18, 1896.

[5] N. Y. Med. Jour., Apr. 18, 1896.

[6] Anat. Anz., Bd. xi. p. 626.

[7] Wien. klin. Woch., No. 4, 1896.

[8] Jour. Anat., and Phys., vol. xxix. p. 488.

Linea Quadrati of Femur.—Brockway[1] has examined 900 femora, and did not find a distinctly marked linea quadrati in any of them.

Supracondyloid Process of Humerus.—Tandler[2] describes a hitherto unrecorded variation of this process. The pronator radii teres arose by two heads from the humerus, and the upper one, which had its origin from the position at which one would expect to find the supracondyloid process, had in it an ossicle, $\frac{3}{4}$ cm. long and $\frac{1}{2}$ cm. wide, imbedded in fibrous tissue.

BLOOD-VESSELS.

Structure of the Arterial Wall.—Bonnet[3] objects to the customary and time-honored division of the coats of arteries into three layers. Of the six layers which Henle first described, he says that the so-called elastica interna, or fenestrated membrane of Henle, and the elastica externa are to be regarded as boundary-plates (grenzlamellen) of the media; they really belong to the media, therefore. He describes the arterial wall as consisting of—1. An intima, comprising only the endothelium; 2. Media, comprising the elastica interna and elastica externa, together with the entire system of elastic and muscular fibers between these two. If there is present, as is the case in the largest arteries, a layer of longitudinal fibers (gestreiftelager of Kölliker), it is to be regarded as part of the media; 3. The adventitia or externa, which would comprise everything external to the elastica externa. Such a mode of division, he states, is favored by histologic and embryologic facts.

Communications between Large Arteries and Veins.—Gerard[4] has found direct communications between large arterial and venous trunks; the communicating branches are from 0.4 to 2 mm. in diameter; they were seen relatively often in new-born infants between the external iliac artery and vein and popliteal artery and vein. He regards these channels as atavistic in origin. Histologically, they resemble veins more than arteries; muscular and elastic fibers are few in number. [It is possible that these so-called anastomosing branches between arteries and veins are in reality vasa vasorum.]

Hepburn[5] describes a rare case of a **third coronary artery of the heart**; all 3 vessels arose independently from the aorta. They were all of about the same diameter; 2 arose from the anterior sinus of Valsalva, and the third from the left posterior sinus. The supernumerary artery supplemented the left coronary, which was defective in its mode of distribution.

LYMPHATICS.

Lymphatics of the Anus and Rectum.—Gerota[6] has studied the lymphatics of the anus and rectum in young children. His results, besides agreeing with facts previously known, show that there are glands, called by him anorectal, lying on the outside of the muscular coat on the posterior part of the rectum, following the course of the inferior hemorrhoidal artery. The

[1] Rep. of Assoc. Am. Anat., 1895.
[2] Anat. Anz., Bd. xi. p. 468.
[3] Deutsch. med. Woch., xxii. 1, 1896.
[4] Arch. de Physiol., vii. p. 597.
[5] Jour. Anat. and Phys., vol. xxix. p. 459.
[6] Arch. f. Anat. u. Entwickelungsgesch., 1895.

cutaneous lymphatics and those of the mucosa communicate freely. On the columns of Morgagni the lymphatic vessels are very numerous; not so in the grooves between them. The cutaneous lymphatics empty, as a rule, into the inner and upper group of inguinal glands.

Lymphatics of the Umbilical Region and Bladder.—Gerota[1] finds that the deep lymphatics of the umbilical region accompany the deep epigastric artery, passing through several small lymph-glands in their course; these glands are called lymphoglandulæ epigastricæ inferiores; from these the lymph passes to the deep inguinal glands. In 2 cases he was able to demonstrate the presence of a small gland behind the umbilicus in the subperitoneal tissue. There are also lymphatics accompanying the round ligament of the liver. The author calls attention to the possibility that these lymph-channels have an etiologic relation to some of the cases of suppuration in the subumbilical space described by Fischer.[2] Concerning the lymphatics of the bladder, he confirms the statements of previous authors that there are 2 sets of lymphatic vessels in the bladder-wall—1 in the mucosa, the other in the muscular coat. Those of the mucosa, which are most abundant in the trigone, and here communicate with the urethral lymphatics, empty into the glands on the lateral wall of the pelvis. Those of the muscular coat pass through glands which lie in the fatty tissue near the umbilical arteries; these glands he calls lymphoglandulæ vesicales laterales. He also found glands in the prevesical space (lymphoglandulæ vesicales anteriores). Both these last-named sets of glands probably play a not unimportant role in suppurative and neoplastic processes in the space of Retzius. The lymph passes from the last-named 2 sets of glands into glands on the *lateral wall* of the pelvis.

Lymphatics of the Lung.—Miller[3] describes the pulmonary lymphatics as consisting of 4 sets: 1. Those associated with the bronchi; 2. Those associated with the arteries; 3. Those associated with the veins; 4. Those of the pleura. Some of the results of his investigations are the following: In the bronchi there is a network of lymphatics lying external to the network of blood-vessels; the vessels end in the terminal bronchi in 3 small vessels. No lymphatics are found in the atria and air-sacs. He has never seen stomata on the surface of the bronchial mucous membrane, nor lymph-capillaries between the epithelial cells of the bronchial mucosa. From the terminal bronchi 1 of the lymph-vessels accompanies a branch of the pulmonary artery. The larger arteries are accompanied by 2 lymphatics which intercommunicate; the smaller arteries have a single accompanying lymph-vessel; the same is true in regard to the veins. Concerning the pleural lymphatics, he states that they form in the hilus of the lung from 3 to 5 large trunks, which anastomose at the hilus with the pulmonary lymphatics. He denies the presence of stomata between the endothelial cells of the pleura.

Regeneration of Lymphatic Vessels.—Bayer[4] calls attention to the edema of the external genitalia which is sometimes observed after bilateral ex-

[1] Anat. Anz., Bd xii. p. 89.
[2] Samml. klin. Vortr., Leipzig, 1894.
[3] Anat. Anz., Bd xii. p. 110.
[4] Arch. f. klin. Chir., Bd xlix. p. 637.

tirpation of the inguinal glands. He refers to the fatty tissue which surrounds lymph-glands, and discusses its importance in the restoration of the lymph-channels after the removal of glands. If there has been for some time interference with the flow of lymph through diseased glands, there can be seen in the periglandular fatty tissue numerous spaces and channels; the smaller channels unite and form larger ones, and finally lymphatic vessels are formed, which accompany the blood-vessels as perivascular spaces. The more marked the interference with the lymph-circulation, the more extensively are perivascular channels established. There is also a secondary dilatation of the normal lymph-channels of the lymph-glands. He also shows that the periglandular fatty tissue by an increased activity of its cells becomes converted into lymphoid tissue under favorable circumstances—*i. e.* if there has been healing by first intention and if the reparative processes have not been interfered with by erysipelas, sloughing, or other inflammatory processes. The preformed spaces in the periglandular connective and adipose tissues thus act as collaterals when there is interference with the normal flow of lymph; and this fact, together with the formation of lymphoid from fatty tissue, leads Bayer to regard the periglandular adipose tissue as a part of the lymphatic system. The practical deductions that he draws from his work are that the fatty tissue surrounding lymph-glands should be as little disturbed as possible in the removal of the glands, and that union by first intention with the avoidance of inflammatory complications should be sought for.

DIGESTIVE SYSTEM.

Peritoneal Fossæ.—Waldeyer[1] calls attention to a fossa which may be found between the liver, duodenum, and upper end of the right kidney if the hepatorenal ligament is strongly developed. The fossa lies under this ligament, between the kidney and duodenum; in the case he describes the fossa was large enough to lodge the terminal phalanx of the thumb. He furthermore calls attention to the occasional large size which the plicæ umbilicales laterales may reach; the umbilical arteries, or their remains in the adult, may have a mesentery 4 or 5 in. in width just above the bladder, and upon making the abdominal walls tense the median inguinal fossæ will appear as quite deep pockets. These abnormally developed peritoneal folds may possibly give rise to internal strangulation.

Fawcett[2] has made the observation that the presence or absence of the cecal or ileocecal pouches is accompanied by absence or presence of the duodenojejunal pouch; in other words, when the cecal fossæ are present the duodenojejunal pouch is absent, and vice versa. No cause for this seeming correlation is apparent.

Extent of the Great Omentum.—Eccles[3] found in 37 out of 89 cases that the great omentum completely covered the small intestine. Its length from the transverse colon to the free border varied between 7.5 and 33.5 cm.

[1] Deutsch. med. Woch., No. 46, 1895, p. 190. [2] Jour. Anat. and Phys., vol. xxix., 1895.
[3] St. Barth. Hosp. Rep., vol. xxx.

The celiac plexus furnishes the nerves to its vessels. Among its functions are the protection of the intestine, absorption of fluids, and also the filling up of spaces between coils of intestine.

Development of the Pancreas.—Jankelowitz[1] has shown by the study of the human embryo of 4 weeks that the pancreas arises from 3 separate "anlagen," 1 dorsally from the epithelium of the duodenum, and 2 ventrically from the ductus choledochus. The development is thus seen to be the same as in the lower animals that have been studied.

Crescents of Gianuzzi.—Küchenmeister[2] has examined the salivary glands of 2 healthy persons shortly after death; he believes that the crescents of Gianuzzi or demilunes of Heidenhain are *not* mucous but serous in character.

Form of Spleen.—Cunningham[3] has investigated the form of the spleen and kidneys by hardening these organs in situ and by reconstruction methods; his description differs somewhat from that given by His. He describes the spleen as having the "shape of an irregular tetrahedron, with its apex above and its base below." The apex is directed inward and upward. The three surfaces, gastric, renal, and basal, which look toward the abdominal cavity, meet at a blunt prominence, which Cunningham calls the "internal basal angle;" these surfaces are separated from one another by ridges. The basal surface of the spleen is in relation with the tail of the pancreas, and to a varying extent with the colon.

NERVOUS SYSTEM.

Neuroglia.—Weigert[4] has studied the neuroglia for the past 7 years. Up to the time of his publication the difficulty in studying the neuroglia consisted in a lack of satisfactory methods of staining this tissue. The method which he has devised does not enable the observer to trace the earliest stages of neurogliar development; only certain peculiarly differentiated fibers are shown. In the human embryo the neuroglia consists only of cells and their processes; in the adult it is composed of cells and fibers, the latter greatly predominating, so that they are to be regarded as the chief constituents. The fibers are not to be looked upon as processes of the cells; they are not identical chemically with the processes of the glia-cells. These fibers, which he stains by his own method, are to be regarded as intercellular substance, not nervous in structure; they are, however, different from the fibers of ordinary connective tissue. Weigert states that, morphologically, the neuroglia is to be regarded as a connective tissue, though the question of its histogenesis will have to be decided by embryologists. In the second part of the work there is given a very accurate account of the topography of the neuroglia, the relations of this substance in all the important parts of the nervous system being

[1] Arch. f. Mikr. Anat., vol. xlvi. 4, 1896. [2] Ibid.

[3] Jour. Anat. and Phys., vol. xxix.

[4] Festschr. z. 50 Jährigen Jubiläum des Arztl. Ver. zu Frankfurt-a-M., Apr., 1895.

described. At the end of the work is given an account of his methods of staining.

Pyramids of the Medulla.—Dejerine and Thomas[1] have demonstrated that the pyramids of the medulla in man contain, in addition to the direct and crossed pyramidal fibers, other fibers, called by them homolateral pyramidal fibers. These, after leaving the pyramid, take their course outward and backward through the gray substance, cutting off the anterior horn, and thus enter the lateral column of the same side. In 1 case they were traced as far as the 4th sacral root. These investigators have traced the crossed pyramidal tract (in cases of degeneration from disease) to the level of the 3d and 4th sacral nerves, in 1 case even to the beginning of the filum terminale. They have followed the direct pyramidal tract to the level of the first lumbar nerve.

Motor Nerves of Muscles of Eyeball.—Mahaim[2] has determined experimentally, by removal of the motor nerves of the eye-muscles in rabbits, according to Gudden's method, that there are in the lateral portion of the posterior longitudinal bundle fibers which connect the nuclei of the 3d, 4th, and 6th cranial nerves.

Trifacial Nerve.—Zander[3] found that the areas supplied by the sensory branches of the trifacial nerve overlap; in fact, some of the branches of the infraorbital, mental, supratrochlear, and other nerves were traced 1 cm. beyond the median line.

Relations between the State of Nerve-cells and Psychical Phenomena.—Cajal[4] discusses the question as to whether more than one nerve-cell is concerned in a given sensation, and states as his belief that there are. For instance, the irritation or excitation of a sensory epithelial cell in the retina passes to a number of pyramidal cells, and a sensation occurs from the combined action of these pyramidal cells. By means of collateral and protoplasmic processes the association of ideas is produced. He does not share Duval's and Rabl-Rückhard's view that the nerve-fibrillæ during sleep retract and thus sever the connection which they had (by contact) with the cell-body and its protoplasmic processes. [During waking hours the processes of the cells were supposed to lengthen and expand, and again come in contact with the cells.] Such an ameboid movement cannot be demonstrated objectively. He points out that the nerve-terminals in the olfactory bulb, cerebellum, optic lobe, etc. always have the same form and extent, and bear the same relation to the cells, no matter what may have been the cause of death; further, that the nerve-terminals in the retina and optic lobes of reptiles and batrachia always present the same appearance whether the animals had been active or the reverse just before death. He, however, believes that certain neuroglia-cells change their form during mental activity, for at times the processes are short and thick; sometimes they are longer and provided with numerous secondary and tertiary

[1] Compt. rend. de la Soc. de Biol., Feb. 14, 1896.

[2] Bull. de la Acad. Roy. de Méd. de Belgique, Aug., 1895.

[3] Sitzungsber. des Ver. f. Wissensch. Heilk. zur Königsberg, Jan. 6, 1896.

[4] Rev. de Med. y Cirurgia practicas, 1895, and Neurolog. Centralbl., 1895.

processes. He does not believe that neuroglia-cells serve the purposes of nutrition or support of the nerve-cells, and gives cogent reasons for this belief. He subdivides neuroglia-cells into 3 classes: 1. Neuroglia-cells of the white substance; these are large fixed cells with sharply-marked, straight processes; their function seems to be to act as a poorly conducting substance between the currents of nerve-irritation. 2. Perivascular neuroglia-cells, found near the capillaries of the gray substance and sending processes to the outer surface of the endothelium. The function of these cells is to cause dilatation of the vessels, and thus hyperemia in certain physiological acts; 3. Neuroglia-cells of the gray substance, sometimes stellate, at other times elongated in form. Their processes have many collaterals. In these cells there may be observed two states—1 of contraction, in which the processes are shortened and the secondary branches disappear; they may be compared to the pigment-cells in the skin of many animals. By the retraction of these processes, which usually occurs by an act of the will, he supposes that the nerve-cells and their processes, which had been kept apart by the neuroglia-processes, come in contact with one another, and thus the brain passes from the resting into the active state. In the other state, that of relaxation of the glia-cells, in which state the processes of the cell pass between the nerve-cells and fibrillæ and act as insulators of the nerve-current and prevent its passage, the brain is put in a condition of quietude *or sleep.*

Hypoglossal Nerve.—Froriep and Beck[1] have examined the medulla in a large number of mammals, including man, with reference to the existence of a dorsal root of the hypoglossal nerve. In artiodactyls, carnivora, and other groups they always found a well-marked dorsal root. In certain other groups the dorsal root is much reduced in size, and in some is absent. The hypoglossal nerve thus resembles a spinal nerve. The first cervical nerve also shows a tendency to decrease in the development of its dorsal root.

Nerves of Diaphragm.—The fact that the intercostal nerves send branches to the diaphragm, though long known, has sometimes escaped mention in text-books. Cavalié[2] has carefully dissected the parts in 6 subjects, and finds that the 6 lower intercostal nerves, while piercing the diaphragm to enter the abdominal walls, give branches to it. The 7th, 8th, and 11th are the most important, some of the others not always supplying branches. These muscular branches are distributed to only a small area of the diaphragm.

Superficial Nerves of the Head.—Frohse[3] in a monograph has given a very excellent description of the superficial nerves of the head. He finds, of course, many variations in different individuals. The two sides of the head often differ from each other considerably. These variations serve to explain the discrepancies that exist in the descriptions and diagrams of Merkel, Hasse, and other modern writers. Frohse makes use of the new anatomical nomenclature adopted by the German Association of Anatomists. He gives [very appropriately, we believe] a special name, ramus maximus nervi

[1] Anat. Anz., Bd. x. No. 29. [2] Jour. de l'Anat. et de la Phys., No. 2, 1896.
[3] Die Oberflächlichen Nerven des Kopfes, Berlin, 1895.

facialis, to that branch of the facial which accompanies the duct of Stenson. The network of nerves on the buccinator muscle he calls plexus buccalis. The communications that exist between the facial and trifacial nerves he regards as crossings or decussations, not as true anastomoses.

Vagal Nucleus.—Grabower[1] insists that there is no connection between the nucleus ambiguus of the vagus and the nuclei of the spinal accessory, and that it is very probable that the vagus, and not the spinal accessory nerve, as has been affirmed by some writers, is the motor nerve of the larynx.

Flocculus.—Bruce[2] has investigated the connections of the flocculus, and found that in a 6½-months-old fetus all the myelinated fibers of the flocculus passed inward toward the nuclei of the auditory nerve in the floor of the 4th ventricle. Part of the fibers of the peduncle of the flocculus end in the external auditory nucleus, but the greater number pass beneath the floor of the 4th ventricle and terminate in the internal auditory nucleus; a small number of fibers end in the nucleus of the 6th nerve, and perhaps a few pass to the formatio reticularis of the same side.

Medullated Fibers of the Brain.—Kaes[3] has investigated the topography of the medullated fibers in the brain, and particularly those of the cortex, by the use of the Weigert stain. He has also made estimates of the amount of cortical tissue present, and gives extensive tables. He hopes that by studies of this sort differences between the cortices of civilized and of uncivilized races may be determined, and that the differences existing at various periods of life may be ascertained. He concludes that the entire cortex has the property of filling itself with medullated fibers. They are most abundant in the motor region, in the occipital and temporal regions—*i. e.* in those portions which are known to be the centers of various functions. He believes that the higher intellectual faculties have their location particularly in those parts of the cortex where the sense-centers are located, and from which the brain sends out its orders centrifugally.

ORGANS OF THE SPECIAL SENSES.

The Ear.—His[4] has made some interesting observations on the anatomy of the osseous part of the organ of hearing of the great musician Bach. Among the facts noted are that the petrous portion of the temporal bone was unusually hard; the fenestra rotunda lay more nearly in the sagittal plane of the body, and was 2½ mm. in diameter; the usual diameter is 1½ mm., according to Krause. The first turn of the cochlea was very large. The eminence produced on the anterior surface of the petrosal by the superior semicircular canal was very well marked.

Organ of Jacobson.—Anton[5] has studied the organ of Jacobson in man. It consists of a grooved portion and a canal. The canal has an

[1] Berl. klin. Woch., Dec. 23, 1895.
[2] Brain, 1895.
[3] Wien. med. Woch., No. 41, 1895.
[4] Abhandl. der Math. Phys. Cl. d. K. Gesellsch. d. Wissensch. zu Leipzig, Bd xxii. No. 5.
[5] Zeit. f. Heilkunde, Bd. xvi.

enlargement with a number of diverticula. The length of the groove in the specimens examined was .46 mm., that of the canal 4.19 mm., on the average. The character of the epithelium in the grooved portion is like that of the regio respiratoria of the nose. In the canalicular part the cells, which rest on a basement membrane, are lower; the mode of transition of the various kinds of epithelium into one another, however, varies in different organs. The epithelium on the mesial wall was higher than that on the lateral, as has been affirmed by Kölliker and Merkel. The glands opening into the organ are saccular mucous glands. Anton examined 5 cases in which that portion of the nasal septum with which this organ is in relation was destroyed by pathological processes, in order to determine whether in these cases there was any disturbance of the sense of smell. No such disturbance was found, and he inclines to the view that the organ of Jacobson in man is quite rudimentary and has no function.

Conjunctival Glands.—Theodoroff[1] says the presence of the sebaceous gland of the conjunctiva described in 1859 by Manz has been denied by many authors; he has found them both in embryos and in adults. There are from 18 to 30 of them in each lid; they are distinct from the tubular glands of Henle, and of varying size, some being oval, others round, with a central opening. They are white in color. They are more abundant in the tarsal conjunctiva, and are situated just beneath the epithelium. They are saccular glands; their lining epithelium is stratified cylindrical in character, and the sacculi contain cells and detritus.

Central Artery of Retina.—Deyl[2] has examined the position of entrance of the central artery of the retina into the optic nerve in 21 injected and 8 uninjected preparations, and finds that the vessel invariably enters the nerve in its lower and inner portion or quadrant. That this is the case in the human embryo and also in the eyes of other vertebrates was well known. However, some of the recent works upon anatomy and ophthalmology state that in the adult the artery enters the nerve in the lower and external quadrant. Vossius assumed, in order to account for this seeming difference, that the embryonic eyeball underwent a rotation through an arc of 90°. Deyl shows that the assumption of Vossius is erroneous, as is also the belief that the macula lutea and fovea centralis are remnants of the cleft in the secondary optic vesicle.

Decussation of Optic Nerve.—Kölliker[3] states that in the optic chiasm there is a complete decussation of the fibers of the optic nerve in many mammals, including man (the chiasm of the dog, fox, rabbit, cat, and man was examined). It has long been known that decussation is complete in fishes, amphibians, reptiles, and birds. Kölliker is uncertain as to whether or not a few very small bundles may or may not remain uncrossed. Scheel in 1874 and Krause in 1876 have claimed that complete decussation occurred. It remains to positively prove or disprove these assertions.

Rods and Cones.—Norris[4] has continued his investigations of the retina,

[1] Centralbl. f. Prakt. Augenheilk., xxix., 1895

[2] Anat. Anz., Bd. xi.

[3] Berl. klin. Woch., May 11, 1896.

[4] Trans. Am. Ophth. Soc., 1895.

and reiterates his former views that the external extremities of the cones and rods are loops, the outer member of a cone bending over to become continuous with the outer member of an adjacent rod, or, less frequently, with the outer member of an adjacent cone ("twin cones" being thus formed). Adjacent rods unite also by their curved outer segments, ending in peripheral loops.

Larynx and Lungs.—Reinke[1] describes 2 folds of the mucous membrane of the true vocal bands—1 on the upper, the other on the lower surface. These folds, which he calls lineæ arcuatæ superior et inferior, divide the upper and lower surfaces of the cord into a mesial and a lateral portion. In artificially-produced edema of the larynx they are most conspicuous.

Pulmonary Alveoli.—Hansemann,[2] after having killed small animals with carbonic-acid-gas inhalations, and injecting the trachea with gelatin and Berlin-blue, stained the sections with acid fuchsin and picric acid. Thread-like communications of the injection-mass between adjacent alveoli could then be seen. He calls these pores between the normal pulmonary alveoli.

GENITO-URINARY ORGANS.

Position and Form of the Kidneys.—Helm[3] has investigated the position of the kidneys in 104 subjects; among his results are the following: In females the kidneys, as a rule, are lower than in males, the difference amounting to about one-half the depth of a lumbar vertebra. In females also extreme variations in position are more common than in males. The upper end of the kidney usually corresponds to the articulation of the 11th or 12th rib to the vertebræ, being more often at the 11th rib in males and at the 12th rib in females. He found accessory renal arteries in 1 of every 3 subjects. Increase in size of the liver does not tend to push the kidney down, but when the liver is decreased in size the kidney seems to be higher. Increase in the size of the spleen is capable of displacing the left kidney; gastrectasis, herniæ, enteroptosis, prolapse of the uterus, and deformities of the chest and vertebral column may also displace the kidneys. Cunningham[4] states that the lower end of the kidney is much more variable in position than the upper end; he also finds that the spleen makes an impression on the *anterior surface* of the organ, *not* on its lateral aspect, as affirmed by His. Cunningham[5] also describes the complicated relations of the kidneys in detail. He finds that the impression of the last rib on the organ is often met, and occasionally small depressions made by the ends of some of the transverse processes of the vertebræ. The convexity of the anterior surface of the kidney is seemingly due, during life, to the presence of a transverse ridge which is situated between an upper and a lower oblique portion.

Malformations of Penis and Urethra.—Kornfeld[6] describes a case of epispadias glandis et penis with an undivided prepuce. The penis, which

[1] Fortschritte der Med., Bd xiii. No. 12.
[2] Sitzungsber. d. K. Preuss. Akad. d. Wissensch. zu Berlin, No. xliv.
[3] Inaug. Dissert., Berlin, 1895.
[4] Jour. Anat. and Phys., vol. xxix. p. 512.
[5] Ibid.
[6] Wien. med. Woch., No. 51, 1895.

was of normal size, was twisted on its long axis, so that the urethral opening looked to the left; this was due to a difference in the development and mode of attachment of the corpora cavernosa. The defect, which was covered by the intact prepuce, involved the glans and extended for a distance of 1½ cm. upon the body of the penis. The other external genitalia were normal. The author calls attention to the fact that in all cases of epispadias extending beyond the glans that have hitherto been reported the prepuce was also cleft.

Double Penis.—Küttner[1] describes a case of true double penis; both penes and both urethræ were normal and alike. The bladder was single and normal in conformation. The division of the urethra into two began just beyond the opening of the ejaculatory ducts; a small communication between the rectum and urethra existed. The scrotum was double, but there was only one testicle on each side. The explanation of the anomaly is to be sought in a duplication of the *anlage* of the penis—*i. e.* of the genital eminence—and of the parts developed from it. Ballantyne and Skirving[2] give a short description of the cases of double penis which have been recorded. They find duplication of the penis in an otherwise "single" individual to be a very rare anomaly, some 20 cases having been met in medical literature. Anomalies associated with it, as atresia ani, may prove dangerous to life. The urine may escape from one penis or from both, or it may pass through a perineal opening. In most of the cases there has existed sterility or impotentia coeundi. Defects in the prepuce usually coexist. The degree of duplication varies much; the two organs may be placed side by side or one may be in front of the other. As to size, they may or may not be equal. The scrotum varies in form; it may be cleft. The testicles are usually 2 in number; they may or may not have descended. The prostate and seminal vesicles vary in development. Associated with diphallism there may be atresia ani, partial or complete division of the bladder into two parts, double urethra, increased width of pelvis, together with a defective symphysis pubis, and hernia of some of the abdominal contents into a perineal pouch. Rarely there coexists duplication of the heart, stomach, and other viscera.

Infundibulopelvic Ligament.—Durand[3] gives a description of the relations and of the mode of development of this ligament. This structure, which Durand calls the ligamentum ileoovaricum or ligamentum appendiculoovaricum de Clado, is present in both sexes, though of course it is more developed in the female. Morphologically, it is the peritoneal covering or mesentery of the Wolffian body, and represents the course taken by the ovaries from the lumbar region to the pelvis.

Fourchet.—The much-discussed question of the relation of the fourchet to the labia majora and to the nymphæ has been investigated by Blacker.[4] In 15% of 397 cases the fourchet was formed by the junction of the posterior extremities of the labia minora; in the rest of the cases it consisted of a fold of skin seemingly uniting the posterior extremities of the labia majora. He

[1] Beitr. z. klin. Chir., 1896, Bd xv. H. 2.
[2] Teratolgia, 1895.
[3] Prog. méd., 1895, No. 27.
[4] Jour. Anat. and Phys., Jan., 1896.

regards the fourchet as being a part of the labia minora, and would advise the abolishing of the terms "anterior and posterior commissures."

SKIN.

Papillary Ridges of Fingers and Toes.—Hepburn[1] has made some interesting researches on the papillary ridges on the hands and feet of man and monkeys. He finds, in general, that the arrangement of these ridges in the lower monkeys is much simpler than in man. In the orang and chimpanzee the plan of arrangement of the ridges more closely resembles that of man. These ridges of papillæ assist the prehensile function of the hands and feet and add to the sensibility of the part.

METHODS.

Method of Demonstrating the Medullated Nerves of the Skin.—Heller[2] gives the following method: After hardening the part in Müller's fluid and cutting sections with the freezing microtome, washing and placing in 1% osmic acid, the sections are placed in an incubator for from 24 to 48 hours at a temperature of 37° C. The sections are then put into the following mixture: Sodium sulphate 125 parts, sodium carbonate 70, distilled water 500, pyrogallic acid 15. This solution darkens the entire preparation, and this blackening continues, so that unless an oxidizing agent is resorted to the preparation is rendered useless. A solution of permanganate of potash is used for this purpose; in this the sections remain until they have become of a light-brown color. Then they are put into a 1–2% solution of osmic acid, after which they are of light yellowish-green color. They are then mounted in glycerin or Canada balsam. The medullated nerve-fibers in these preparations are of a deep-black color.

Formalin.—Gerota[3] states that one of the most valuable properties of formalin is the hardening of the organs which it produces, causing them to retain their natural position; if they are temporarily removed from their place, they will return to their former position. If it is desired to fix the organs in situ and to study them by ordinary dissection, the arteries are injected with 5 liters of a 15% solution of formalin. They are thus fixed in from 2 to 3 days, and acquire an elastic hardness; the body can be permanently kept and very neat dissections made. If frozen sections are desired, the vessels are injected with 4 liters of a 5% solution of formalin. After this the body is frozen. Immediately after making the sections they are put into a 4% solution of formalin, where they may remain for from 5 to 8 days to harden them still more. Before the parts are dissected they are washed in water to rid them of superfluous formalin, the vapor of which is very irritating to mucous membrane. By the above method the organs are hardened before sectioning, are harder than they can be made with alcohol, and less time is required; furthermore, the method is less expensive than the use of alcohol. A disadvantage

[1] Sci. Trans. of Royal Dublin Soc., vol. v. series 2, 1895.

[2] Berl. klin. Woch., Dec. 16, 1895, p. 1091.

[3] Anat. Anz., Bd. xi. p. 417.

of alcohol is that it dissolves the fat and causes the subcutaneous tissue to resemble a fascia; this is not the case with formalin, and so the study of the fasciæ is made easier.

To prepare microscopic topographic specimens of embryos and the new-born the carotid or umbilical arteries are injected with a mixture of 20 g. of formalin in 100 g. of 90% alcohol; for a 6-months' fetus 200 to 250 g. of this mixture are necessary. After the injection the entire fetus is placed in a 10% aqueous solution of formalin. After 4 or 5 days sections can be made with a sharp brain-knife. Very good preparations of the fetal brain can be obtained in this way. For the literature on formalin see Anat. Anz., Bd. xi.

MISCELLANEOUS.

Pithecanthropus Erectus.—Concerning the remains found by Dubois in Java (see the *Year-Book* for 1896) there has been a great deal of discussion, and the differences of opinion among anatomists, zoologists, and anthropologists are so great and irreconcilable that no definite statement can as yet be made as to what Dubois has really discovered. As Virchow says, it will be necessary to await the finding of further remains in the East Indies and Sunda Islands before positive conclusions can be reached.

Congenital Deformities of the Extremities.—Lewin[1] divides supernumerary little digits (fingers and toes) into the three following classes: 1. Those that articulate with a separate metacarpal or metatarsal bone; 2. Those that articulate with the metacarpal or metatarsal bone of the fifth digit; 3. Those which have simply fibrous or ligamentous connection with the fifth digit. Those of the first kind are constantly supplied with tendons; sometimes tendons are found in the second class, though never in the third class; these tendons do not, however, permit of an independent movement of the digits. Nerves are always present.

Joachimsthal[2] reports, among other cases of **congenital deformities of the extremities,** one in which the humerus was entirely absent, the normal hand being joined to the scapula by a radius and ulna. In the same journal is recorded a case of a 6-days-old girl in whom the right femur was represented by a bony mass 3 cm. in length.

Absence of Abdominal Muscles.—Parker[3] describes the case of an infant in whom some of the muscles of the abdominal wall were absent, the parietes being as thin as parchment; only the upper and lower ends of the rectus were present; no other muscles were found anteriorly. The muscles of the back were normal. Langton also referred to a case in which the abdominal wall consisted only of skin and subcutaneous fascia.

Gynecomastia.—Stieda[4] has examined 2 cases of this anomaly histologically. Both were males, aged 23 years. In 1 case the gynecomastia was single, in the other double. The gland had been removed on account of the subjective symptoms caused by it. Stieda finds that there is no histologic cor-

[1] Virch. Arch., cxliii. 2, 1895.
[2] Deutsch. med Woch., No. 12, 1895.
[3] Lancet, 1895.
[4] Beit. z. klin. Chir., Bd xiv. H. 1.

respondence, or even resemblance, between the breasts of cases of gynecomastia and the functionating female breast. The condition consists in a hyperplasia of all the components of the male gland, particularly of the connective tissue. The gland-ducts present clubbed diverticula or outgrowths, but they are not sufficiently developed to justify one in calling them acini.

Plasma-cells.—Hodara[1] discusses the question as to whether the plasma-cells of Unna are found in the organs of the hematopoietic system, as has been maintained by some investigators. He examined a considerable number of specimens of spleen, lymph-glands, and bone-marrow and failed to find the plasma-cells in normal organs. Cells which resemble them are met with; these he classes with the large mononuclear leukocytes. He regards the plasma-cells of Unna as pathologic products, either from a connective-tissue cell or from leukocytes.

Thymus.—The fact that the thymus partially persists throughout life, though of course in a very much modified form, was first clearly shown by Waldeyer. Sultan[2] describes the changes which the organ undergoes. In an infant 9 weeks old he found the remains of a canal lined by columnar epithelium; he thinks that he also found remains of this canal in an individual 50 years of age. This is the remains of the "anlage" of the gland. He found eosinophile cells in the periphery of the acini in the young thymus. Concerning the histologic changes in the involution of the gland, he states that epithelioid cells, derived from the endothelium of small vessels and from other connective-tissue cells in their vicinity, appear in the acini and replace the original cells. These epithelioid cells become converted into fat-cells. In the later stages the lymphoid cells become completely replaced by spindle-cells, and epithelioid cell-groups appear, giving the organ the appearance of a gland.

Glandulæ Parathyroideæ.—Schaper[3] states (see also *Year-Book* for 1896) that the so-called external epithelial bodies found in the neighborhood of the thyroid gland and in the vicinity of the carotid artery of certain mammals, including man, are detached portions of the developing lateral portions of the thyroid gland; these detached portions have remained behind in their development. Usually they remain in their rudimentary state, but they may under certain circumstances develop into tissue more closely resembling the thyroid. Alveoli may form or a pathologic cystic degeneration may occur. The "internal epithelial body" of man is capable of giving rise to functionally active thyroid-gland tissue. Schaper regards both the internal and external epithelial bodies as morphologically identical, representing masses of tissue which have in some way become detached from the developing thyroid gland and persisting in their embryologic condition.

[1] Ann. de Dermat., vi. 10, 1895, p. 856. [2] Arch. f. pathol. Anat., Bd cxliv. p. 548.
[3] Arch. f. mik. Anat., xlvii., 1895.

PHYSIOLOGY.

By G. N. STEWART, M. D.,

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Epitome.—The following are a few of the more important investigations referred to in the accompanying article: The proof that fibrin-ferment is a nucleoproteid (Pekelharing and Halliburton); the evidence given by Gryns, Cowl, and others that the centrifugal method of determining the volume of the blood-corpuscles (by the hematocrite) is capable of accurate results; the discussion by Winter, Koeppe, and others of the relations of osmosis to physiologic processes, including the formation of the HCl of the gastric juice; Porter's demonstration of the existence in the vagus of vasomotor nerves for the heart; the experiments of Oliver and Schäfer on the internal secretion of the suprarenal and other glands; Schöndorff's researches on urea; the demonstration by Kunkel and others of the absorption of inorganic iron; Lohnstein's modification of Roberts' method of estimating sugar in the urine for clinical purposes; the proof afforded by Nuttall and Thierfelder that the intestinal bacteria are not essential to life and growth; the investigations of Chittenden and Mendel on the influence of alcohol on artificial digestion; Haldane's researches on carbon-monoxid-poisoning; the experiments of Schumburg and Zuntz on the cause of mountain-sickness and the changes in gaseous metabolism at high altitudes; the work of Filehne and Kionka on the mechanism by which the respiratory activity is increased during muscular exertion; the demonstration by Goltz and Ewald that various functions (in the dog) are unaffected by the absence of large portions of the spinal cord; Strehl's discussion of the functions of the labyrinth; and the evidence adduced by v. Kries, from investigations on color-blindness, in favor of the Young-Helmholtz theory of color-vision.

BLOOD, LYMPH, AND CIRCULATION.

Coagulation of the Blood.—[During the past year our knowledge of this subject—one of the dark places of the earth from the physiologic standpoint—has made material progress.] The friendly controversy which for several years has been maintained between Halliburton and Pekelharing as to the precise chemic nature of the fibrin-ferment has at last been settled by the admission of the former[1] that fibrin-ferment and the similar or identical substances which can be obtained from masses of adenoid tissue like the thymus or from the stromata of the red blood-corpuscles are nucleoproteids. [Another

[1] Jour. of Phys., Sept. 5, 1895, p. 306.

discussion of equal interest, and perhaps not less fruitful, on the role of the calcium salts in coagulation, has been brought to a less fortunate termination by the lamented death of one of the disputants, Alexander Schmidt. Schmidt maintained that the action of soluble oxalates in preventing coagulation was due to a specific anticoagulant power, and not to the precipitation of the salts of lime.] Arthus[1] in an elaborate investigation has [in our opinion] successfully defended the position that oxalated blood loses the power of coagulation, not because it is oxalated, but because it is decalcified. Lilienfeld[2] restates his position on the question of coagulation. In brief, he supposes that fibrin is formed by the union of calcium and thrombosin, a substance derived from the splitting up of fibrinogen under the influence of nucleoproteids set free from the broken-down leukocytes. [While, on the whole, his theory takes adequate account of the calcium and fibrinogen as factors in the formation of fibrin, and can be readily translated into terms of Pekelharing's scheme], he asserts [but without sufficient evidence], in opposition to the ordinary view, that fibrin-ferment is not a forerunner, but a product, of coagulation. [However this may be, we can no longer look upon the action of the nucleoproteids as a unique and specific action.] Gelatin (Dastre and Floresco[3]) and certain colloids prepared by synthesis (Halliburton and Pickering[4]), have been shown to possess a similar power of causing intravascular coagulation. Not only so, but gelatin also acts as a coagulating agent outside the vessels; and, while it does not hinder the anticoagulant action of oxalates, it antagonizes the proteoses. As to this anticoagulant action of proteoses, Ledoux[5] adopts the view that injected proteoses acquire their peculiar powers after undergoing modifications in the organism. Contejean,[6] on the other hand, thinks it more probable that the anticoagulant substance is secreted as one of the products of the reaction of the organism, and has no other relation to the injected proteoses. The assertion of Gley and Pachon[7] that a normal condition of the liver-cells is essential to the action of peptone (proteoses) on coagulation, and that ligation of the portal lymphatics renders the subsequent injection of peptone ineffectual [a statement which certainly lent strong support to this view of Contejean], has been contradicted by Starling[8] [and may, we believe, be considered devoid of foundation].

Formation of Red Blood-corpuscles.—Neumann[9] continues his valuable histologic researches on the formation of the red corpuscles. He finds, in confirmation of the results of Marquis, that in frogs in the spring and early summer the blood-forming activity of the red bone-marrow experiences a sudden increase; and, in agreement with Kölliker, he traces the genealogy of the newly-formed corpuscles back to the mononuclear leukocytes or lymphocytes. Danilewski[10] states that after injection of extracts of spleen and bone-

[1] Arch. de Phys., Jan., 1896, p. 47.
[2] Centralbl. f. Phys., July 13, 1895, p. 331.
[3] Arch. de Phys., Apr., 1896, p. 402.
[4] Jour. of Phys., Sept. 5, 1895, p. 297.
[5] Arch. belges de Biologie, June, 1895.
[6] Arch. de Phys., Jan., 1896, p. 159.
[7] Ibid., Oct., 1895, p. 711.
[8] Jour. of Phys., Dec. 30, 1895, p. 15.
[9] Virch. Arch., cxliii. p. 225.
[10] Pflüger's Arch., Bd. lxi. p. 264.

marrow into the peritoneal cavity the number of red blood-corpuscles is increased. [But while this result is not in itself unlikely, since such extracts contain organic iron, the fact that no systematic estimations of the specific gravity or the total solids of the blood were made renders it impossible to say how far a mere change in the concentration of the blood might have caused an apparent increase in the number of the corpuscles. And we know that the specific gravity of the blood may be altered by various circumstances; *e. g.*, as shown by Moikowski,[1] by stimulation of the vagus. The same omission somewhat diminishes the value of the interesting experiments of Southgate[2]], who estimated the volume of the red corpuscles (by centrifugalization in the "hematocrite") before and after injection of blood into the peritoneal cavity. He found, in accordance with the statements of Hunter, Ponfick, and others, that the richness of the blood in corpuscular elements is rapidly increased after the injection, reaching its maximum in as short a period as 3 hours.

Estimation of the Volume of the Corpuscles.—Hedin[3] and Koeppe,[4] continuing their previous work, have demonstrated that it is only salt-solutions of the same osmotic tension as the serum [*i. e.* which contain the same number of molecules per unit of volume, or, what is tantamount to this, have the same freezing-point] which do not alter the volume of the red corpuscles as determined by the hematocrite. It has been shown by Eykman[5] that the 0.6% NaCl solution used by Bleibtreu for diluting the blood in his [chemic] method of estimation gives an erroneous result, owing to the absorption of water by, and consequent increase in the volume of, the corpuscles. Hedin[6] has stated that not a 0.6% solution of NaCl, but a 0.96% solution, is isotonic with the blood of the ox, and Gryns,[7] that a 0.88 to 0.84% solution is isotonic with human blood. Bleibtreu[8] has indeed admitted that his solution was not, and must be made, isotonic with the blood, and he also withdraws his former unconditional condemnation of the centrifugal method, which he allows to be capable, with proper precautions, of yielding good results. This is also the conclusion [and to it we adhere] of Gryns[9] and Cowl,[10] both of whom lay stress upon the necessity of using accurately-made mixing solutions. The formula recommended by the latter is sodium oxalate 2 parts, NaCl 1 part, aq. dest. 1000 parts.

Osmosis and Lymph-formation.—[On this subject and on the cognate topic of absorption from serous cavities and connective-tissue spaces the annual crop of important and interesting papers has again been very large. The investigations of de Vries, Van't Hoff, and others in the domain of molecular physics have given to our notions of osmosis the precision which was wanted before its relation to many physiologic processes could be profitably discussed. In particular, Van't Hoff's discovery that the osmotic pressure depends on,

[1] Arch. des Sci. biol. de St. Pétersburg, iv. p. 241.
[2] Med. Rec., N. Y., Aug. 17, 1895.
[3] Skand. Arch. f. Phys., v. pp. 207, 328, and 377.
[4] Arch. f. (Anat. u.) Phys., 1895, p. 154.
[5] Pflüger's Arch., Bd. lx. p. 340.
[6] Loc. cit.
[7] Pflüger's Arch., Bd. lxiii. p. 86.
[8] Ibid., Bd. lx. p. 405.
[9] Loc. cit.
[10] Med. Rec., N. Y., Aug. 17, 1895.

and is proportional to, the number of molecules dissolved in a given quantity of the solvent and to the absolute temperature, and the method elaborated by Raoult of determining the molecular concentration of a solution from the difference between its freezing-point and that of the solvent, have found fruitful application in the hands of numerous workers.] Winter[1] has found that blood-serum, milk, and 0.91% NaCl solution freeze at the same temperature (— 0.55°)—*i. e.* are equimolecular or isotonic solutions. The serous fluids, such as pleuritic, ascitic, and hydrocele fluids, oscillate within narrow limits about the same mean of — 0.55° ; *i. e.* they are approximately in equilibrium with the blood.[2] On the other hand, the "functional liquids," such as gastric juice and urine, have a molecular concentration usually far removed from that of the blood-serum. Accordingly, equilibrium cannot exist between them and the blood; and it is the absence of this equilibrium which, according to Winter, determines, on the one hand, the passage of liquid from the plasma to the urine, and, on the other, the passage of the gastric contents into the blood. By numerous determinations he[3] actually finds that the molecular concentration of the contents of the stomach at different stages of digestion varies between two rather wide but mathematically rigid limits: — 0.36°, which represents the limit of resistance of the cells, *i. e.* corresponds to the most dilute solution of NaCl with which cells such as the red blood-corpuscles can be placed in contact without being broken up, and — 0.55°, the molecular concentration of the blood-serum. He attributes great importance to the inorganic constituents of the physiological liquids, and particularly to the NaCl, which furnishes two-thirds of the molecules that circulate in the blood and lymph. [The author of these brilliant and suggestive papers speaks of such physiological processes being "compelled by blind osmotic laws," but it has not escaped him (although we doubt whether he has given due weight to this consideration) that behind the uniformly acting osmotic laws we come again upon the diversity of life so soon as we ask the question, How is it that the contents of the uriniferous tubules and of the stomach are kept at a molecular concentration so different that osmosis can cause in the one case a constant outward stream of waste material, and in the other a steady inward flow of food-substances? This is a question which we may put, but which Winter does not answer; and we are thus again thrown back upon specific cellular powers.]

Lazarus-Barlow[4] has emphasized the importance of attending to the initial rate of osmosis rather than the final osmotic pressure [the latter being what is deduced from the freezing-point] in considering the bearing of osmosis on physiologic processes, and particularly on the vexed question of the mechanism of lymph-formation.

Cohnstein[5] states that the maximum concentration of the lymph after injection of substances like NaCl and sugar never exceeds that of the blood-serum, as Heidenhain asserted. He points out [and in this he is undoubtedly

[1] Compt. rend., Nov. 11, 1895.
[2] Winter, Arch. de Phys., Jan., 1896, p. 114.
[3] Ibid., p. 296.
[4] Jour. Phys., Dec. 30, 1895, p. 140.
[5] Pflüger's Arch., Bd. lxii., 1895, p. 58.

right] that Heidenhain's comparison of samples of blood and lymph taken simultaneously was an improper procedure, for the lymph flowing at any given moment from the thoracic duct is lymph which has been formed from the blood, not at that moment, but at some unknown earlier period. And although Mendel[1] has found occasionally, after intravenous injection of NaI, a greater maximum concentration of it in lymph than in blood, Cohnstein[2] has traced this result to the fact that Mendel allowed an appreciable interval to go by, after completing the injection, before he determined the amount of NaI in the blood. Some of the injected salt would therefore have time to pass from the blood into the lymph. [It is perhaps an equally important source of error that, with the large quantities of NaI injected, the osmotic pressure of the blood would be considerably increased; and] Leathes[3] has shown that an increase in the osmotic pressure of the blood is compensated very rapidly by the inflow of liquid from the tissues.

Starling[4] asserts, in support of the physical theory, that even salt-solutions isotonic with the blood-plasma can be absorbed by the blood-vessels in virtue of the osmotic pressure exerted by the proteids of the plasma [which although very much less than that of substances like NaCl, for membranes like ferrocyanide of copper, impermeable both to crystalloids and colloids, is relatively considerable for membranes, such as the capillary walls, which can be readily traversed by the crystalloid molecules, with difficulty by the colloids].

On the other hand, Ostowsky[5] finds that the flow of lymph from the testicle is increased by intravenous injection of minute doses of pilocarpin, while the arterial pressure is unaffected. [The suggestion that pilocarpin acts on the capillary endothelium as it does on the cells of the salivary and other glands would carry more weight, however, if changes in the capillary pressure could have been controlled by simultaneous observations of the blood-pressure in the veins of the organ.] Lazarus-Barlow[6] sums up strongly against the physical view. Among other conclusions he points out—(*a*) that the maximum outflow of lymph does not occur at the time of maximum intravenous pressure; (*b*) that in the great majority of his experiments the injection of a concentrated solution of NaCl, glucose, or urea was followed, not by an initial diminution in the outflow of lymph from the thoracic duct [as might have been expected if a rapid transference of water from the tissue-spaces to the blood took place], but by an immediate increase. Tscherewkow[7] ranges himself also on the "vitalistic" side on the strength of experiments in which the blood-pressure was reduced by hemorrhage without any marked diminution in the outflow of lymph. [On the whole, it may be said that the general trend of research is at present to abridge to a certain extent the field of specific vital action so far as the capillary endothelium is concerned, and to correspond-

[1] Jour. Phys., Mar. 6, 1896, p. 227.
[2] Pflüger's Arch., Bd. lxiii., 1896, p. 587.
[3] Jour. Phys., Dec. 30, 1895, p. 1.
[4] Ibid., May 5, 1896, p. 228.
[5] Centralbl. f. Phys., Feb. 22, 1896, p. 697.
[6] Jour. of Phys., May 30, 1896, p. 418.
[7] Pflüger's Arch., Bd. lxii., 1895, p. 304.

ingly enlarge the "sphere of influence" of the more purely physical processes of filtration and osmosis.]

Absorption from Serous Spaces.—Heidenhain [1] offers a detailed [and, as it seems to us, convincing] criticism of Cohnstein's attack [2] on the conclusion of Orlow,[3] that absorption of soluble substances from the peritoneal cavity takes place essentially through the blood-capillaries. Cohnstein asserted that the absorption was due solely to the lymphatics—a view which was also, though less uncompromisingly, put forward by Starling and Leathes.[4] Everybody is agreed that solid particles find their way into the lymphatics of the diaphragm, passing, according to Muscatello,[5] between the endothelial cells or being carried in by leukocytes. Solutions, too, can be mechanically sucked into the lymphatics by the movements of the diaphragm, and, as Reibmayer and Höffinger have shown, absorption from the peritoneum is favored by massage. The same is true, according to Kellgren and Colombo,[6] of the absorption of liquids injected into the muscles and joints, and presumably of pathologic exudations. And they believe that the veins, as well as the lymphatics, are intimately concerned in this.

Vasomotor Nerves.—Porter[7] has demonstrated the presence in the cat's vagus of vasoconstrictor fibers for the heart. Bayliss and Hill [8] have reexamined the question of the vasomotors of the brain, and conclude [as we think, with good reason] that there is no evidence of their existence nor of the existence of any local vasomotor mechanism, such as Roy and Sherrington assumed. The volume of the brain is practically invariable. A rise in arterial pressure always causes an increase, and a fall a decrease, in the velocity of the blood-flow through the brain. They do not believe that the rise of arterial pressure in cases of increased intracranial pressure is protective, and the old treatment of lowering the blood-pressure by depletion and purgation is therefore the right one. Gulland,[9] too, from the histologic side finds no evidence of the presence of nerves in the walls of the cerebral blood-vessels.

François-Franck [10] has again attacked the problem of the existence of pulmonary vasomotor nerves. Recording the blood-pressure at the same time in the pulmonary artery, left auricle, and aorta, he comes to the conclusion [a conclusion which, since the work of Bradford and Dean, can hardly have appeared doubtful to any one conversant with the subject] that vasoconstrictor nerves for the lungs exist and can be reflexly excited in various ways. He sees in reflex spasm of the pulmonary vessels, associated with inhibition of the heart, the conditions that determine acute dilatation of the right ventricle in certain painful affections of the abdomen. Reflex spasm of the pulmonary vessels and constriction of the bronchi are also essential elements in the production of reflex asthma.

[1] Pflüger's Arch., Bd. lxii., 1895, p. 320.
[2] Centralbl. f. Phys., Sept. 21, 1895.
[3] Pflüger's Arch., Bd. lix. p. 179.
[4] Jour. of Phys., vol. xviii. p. 106.
[5] Virchow's Arch., cxlii. p. 327.
[6] Arch. de Phys., Apr., 1896, p. 462.
[7] Boston M. and S. Jour., Jan. 9, 1896.
[8] Jour. of Phys., Sept. 5, 1895, p. 334.
[9] Ibid., p. 361.
[10] Arch. de Phys., Jan., 1896, p. 178.

Werziloff[1] states that vasodilators for the skin of the posterior limb exist in the posterior roots of certain lumbar and sacral nerves. [This is a statement which has been previously made, but it cannot, as yet, be considered definitely proved. The same is true of] the assertion of Steinach and Wiener[2] that the posterior roots contain motor fibers for the intestines.

Hallion and François-Franck[3] have traced the vasoconstrictor fibers of the intestine from the spinal cord through the sympathetic ganglia into the splanchnics. The innervation of the smooth muscular tissue of the spleen has been investigated by Schäfer and Moore.[4] They find that while the rhythmical contractions of the spleen can be carried on independently of the cerebro-spinal and sympathetic nervous system, its volume can be profoundly influenced by nerves, both by vasomotor fibers which affect the general blood-pressure, and more directly by fibers which act on its unstriped muscular tissue.

The reflex fall of blood-pressure which, under certain circumstances—*e. g.* in chloroform or chloral narcosis—is known to result from stimulation of afferent nerves has been reinvestigated by Hunt.[5] He finds very strong evidence for the presence of depressor or reflex vasodilator fibers in the sciatic and other nerves. These seem to be readily excited in nerves that have been cooled, in regenerating nerves, and mechanically by the kneading of muscles. On the other hand, direct stimulation of the central end of muscular nerves always causes a rise of blood-pressure. [This fact was previously shown by the author of this abstract in conjunction with C. Ewald.]

Shields[6] has studied the effect of odors and mental work on the blood-flow by means of an improved plethysmograph and an elaborate arrangement which permitted the nostrils of the person under investigation being, so to speak, irrigated with odors from any one of 13 different taps, and then washed out by a stream of odorless air from a fourteenth. He finds that sensations, when they produce any effect at all through the vasomotor system, tend to diminish the volume of the arm. The same is the case with mental work. [But it is difficult, in the light of the results of Bayliss and Hill, quoted above, to admit, what Shields seems to suggest, that this diminution is caused by the withdrawal of blood to the brain, for the quantity of blood in the cerebral vessels can vary only slightly. It is therefore more probable that the diminution in the volume of the arm, if it is connected with changes in the cerebral circulation, is the local expression of a general vasoconstriction, and a consequent rise of arterial pressure, which would increase not so much the congestion of the vessels of the brain as the velocity of the blood in them.]

The Heart.—Porter[7] has continued his reinvestigation of the cause of the phenomena which follow complete or partial stoppage of the coronary circulation. He shows [and, we think conclusively], in opposition to the view of

[1] Centralbl. f. Phys., June 27, 1896, p. 194.
[2] Pflüger's Arch., Bd. lx., 1895, p. 590.
[3] Arch. de Phys., Apr., 1896, pp. 478 and 493.
[4] Jour. Phys., June 6, 1896, p. 1.
[5] Ibid., Nov. 16, 1895, p. 381.
[6] Jour. Exp. Med., vol. i. p. 71.
[7] Ibid., vol. i. p. 46; Centralbl. f. Phys., Jan. 25, 1896, p. 641.

Fenoglio and Drogoul,[1] of Tigerstedt,[2] and of Langendorff,[3] that none of the phenomena, not even the fibrillary contractions, are due to mechanical injury, but all to the cutting off of the blood-supply.

METABOLISM, NUTRITION, AND DIETETICS.

[In this department of Physiology the greatest amount of attention has again been given to internal secretion, and to questions connected with the formation and the fate of sugar in the organism.]

Internal Secretion; Suprarenal Capsules.—The important work of Oliver and Schäfer on the *suprarenal capsules*, to which we drew attention in the *Year-Book* for 1896, but which at that time had only been made known by a preliminary communication, has now been published in detail.[4] They conclude [and the conclusion seems warranted, at least provisionally] that one of the main functions, if not the main function, of the glands is to produce a substance which assists in maintaining the necessary muscular tone, and particularly the tone of the smooth muscle of the vascular system. Experimental removal of the capsules is followed by extreme weakness of the heart and loss of tone of the blood-vessels, in striking analogy with the symptoms that are known to accompany their degeneration in Addison's disease.

Cybulski and Syzmonowicz,[5] who have made an independent study of the same subject [although with more meagre results], assert [but, we believe, erroneously], in opposition to Oliver and Schäfer, that the marked rise of blood-pressure, caused by intravenous injection of suprarenal extract, is due to stimulation of the vasomotor center, and not to direct action on the vessels. They state that the active substance is a crystalloid with basic properties.

Dubois[6] comes to the conclusion that the function of the capsules is to destroy certain toxic substances, especially waste-products of muscular activity. There exist always, according to him, in the medulla of the glands, certain alkaloidal toxins [accumulated here, perhaps, in order to be destroyed?], and these are the substances which act so powerfully on muscular tissue and on certain nerve-centers. [It is evident that while this theory is diametrically opposed to that of Oliver and Schäfer, it is not irreconcilable with their experimental results; and, so far as we can see, further investigation is necessary to decide between the two.] That the suprarenals have some such poison-destroying function as Dubois has suggested is also indicated by the experiments of Boinet,[7] who finds that the usual causes of death after extirpation of the capsules (in rats) are (*a*) the accumulation of substances in the muscles, blood, etc., which produce toxic symptoms on injection into normal animals, and (*b*) pigmentary changes in the blood.

[1] Arch. ital. de Biol., vol. ix.

[2] Skand. Arch. f. Phys., Bd. v., 1895, and Centralbl. f. Phys., Nov. 30, 1895.

[3] Pflüger's Arch., Bd. lxi., 1895, p. 291.

[4] Jour. Phys., July 18, 1895, p. 230; Brit. Med. Jour., Aug. 10, 1895.

[5] Sitz. d. Akad. d. Wiss. in Krakau, Feb. 4 and Mar. 4, 1895; Wien. med. Woch., Feb. 1–8, 1896.

[6] Arch. de Phys., Apr., 1896, p. 412. [7] Compt. rend. Soc. de Biol., 1895, pp. 162, 646.

Thyroid.—[Recent work on the thyroid has in general raised more questions than it has settled.] De Dominicis[1] has endeavored, as others have done, to clear up a few of these. He finds that in quite exceptional cases (2 out of 29 dogs) the animals remain well after thyroidectomy. [Unfortunately, he did not determine whether in these cases accessory thyroids were present. The author of this abstract has found in a similar case a small body of thyroid structure in the neighborhood of the aortic arch.] He sums up by saying that the symptoms which follow thyroidectomy are those of autointoxication (of the nervous system) by poisons which, under normal circumstances, it is the office of the thyroid to destroy. A similar conclusion is reached by Blumreich and Jacoby,[2] who, however, report that in rabbits the so-called parathyroids have no histological resemblance, and probably no genetic relation, to the thyroid proper, and that their presence or absence does not affect the results of thyroidectomy. Notkin[3] goes so far as to announce that he has isolated from the thyroid certain toxic proteid substances which cause in animals symptoms similar to those observed after extirpation of the glands. [But the symptoms caused by thyroidectomy are by no means so definite and unmistakable as to render it unlikely that an observer, in making a generalization of this sort, may easily be led into error by an accidental and superficial resemblance.]

As to the precise nature of the therapeutically active substance in thyroid extracts many different statements have been made. Kocher,[4] under Drechsel's guidance, has isolated two crystalline and proteid-free bases, one of which is perhaps identical with the body discovered by Fränkel,[5] and named by him thyreoantitoxin. Baumann[6] has extracted a substance (thyriodin) containing iodin. All of these bodies are stated to have a favorable influence upon the symptoms induced in animals by thyroidectomy. [But we doubt whether a sufficient number of control-experiments have yet been made to test their efficacy, and thyroid-feeding *in animals* has usually been very unsuccessful; *e. g.* of several thyroidless dogs fed [by the author of this abstract] with fresh thyroids and commercial extracts not one survived]. And Edmunds[7] saved only 2 dogs out of 20. Gottlieb,[8] again, found thyriodin inactive, while a commercial preparation acted well.

According to Treupel,[9] thyriodin causes an increased nitrogenous metabolism in man, as do (in the dog) the thyroid tablets of Burroughs, Wellcome & Co. (Schöndorff),[10] and the glands themselves (Roos).[11]

Dutto and Lo Monaco[12] state that the injection of physiologic salt-solution into the vessels causes, along with transient amelioration of the cachectic symptoms, in thyroidless dogs an increase in the excretion of N; and from this they draw the conclusion [with considerable temerity, as it seems to us] that

[1] Gior. d. Ass. Nap. di med. e nat., anno v. punt 2; Wien. med. Woch., Sept. 14, 1895.
[2] Berl. klin. Woch., xxxiii. No. 15, p. 327.
[3] Wien. med. Woch., 1895, p. 824.
[4] Centralbl. f. Phys., Feb. 22, 1896, p. 705.
[5] Wien. klin. Woch., 1895, No. 48.
[6] Zeit. f. Physiol. Chem., xxi. p. 319.
[7] Jour. Phys., July 18, 1895, p. xxix.
[8] Deutsch. med. Woch., xxii. No. 15, p. 235.
[9] Münch. med. Woch., 1896., p. 117.
[10] Pflüger's Arch., Bd. lxiii., May 13, 1896, p. 423.
[11] Zeit. f. Physiol. Chem., xxi., 1895, p. 19.
[12] Atti d. R. Accad. dei Lincei, 1° sem., 1895, No. 11, p. 458.

in consequence of the loss of the thyroids a nitrogenous substance is held back in the organism and "washed out" by the injection.

Pituitary Body.—According to Oliver and Schäfer,[1] the action of extracts of the pituitary body is, upon the whole, similar to that of suprarenal extracts, except that there is no inhibition of the heart and that a much larger dose is required. There is no evidence that the pituitary can take on the functions of the thyroid after excision of the latter, and indeed the physiologic action of thyroid extracts is entirely different.

Testicle.—[Alternately ridiculed by the skeptics and overpraised by the fanatics, orchitic extract has, since Brown-Séquard's first announcement of its virtues, remained the *enfant terrible* of medical literature. A sober investigation of its physiologic action with the ordinary appliances of the laboratory is therefore a welcome contribution to our knowledge.] Such an investigation has been undertaken by Zoth[2] and Pregel,[3] who by means of ergographic experiments found, contrary to their expectations [a very important point in estimating the value of results obtained by the ergograph], that the power of muscular work was markedly increased (up to 50% of its initial value) by daily injections of the extract.

According to Legueu,[4] atrophy of the prostate occurs in dogs after castration, just as in man. Excision of the vasa deferentia, however, causes well-marked atrophy only in rare cases.

The Glycogenic Function of the Liver.—[In the *Year-Book* for 1896 we gave an abstract of Noël Paton's defence of the orthodox position, that sugar is normally formed in the liver, against the view so long identified with the name of Pavy. Since then Pavy[5] has answered Paton, and Paton[6] has replied to Pavy; but nothing has been said which makes it necessary to modify the opinion we then expressed, that the doctrine of Pavy is not supported by sufficient evidence.] Mosse[7] takes up a middle position between Pavy, who denies that the blood of the hepatic veins contains any excess whatever of sugar, and Seegen, who asserts that there may be twice as much sugar in the hepatic as in the portal blood. Using a method of catheterizing the hepatic vein [the priority of which he attributes to Abeles, but which we believe belongs to Pavy], Mosse concludes that while sugar is formed in the liver, the hepatic sugar is not the only source of the sugar of the blood. [This is a conclusion which may be formally correct, but the intimate relation between the liver and the sugar of the blood is sufficiently attested by the fact that after elimination of the liver the blood rapidly becomes free, or nearly free, from sugar (Minkowski, Seegen).] And a similar result follows such interference with the hepatic circulation as is caused by the ligation of the three chief arteries of the intestine (Tangl and Harley[8]) or removal of the whole of the abdominal viscera except the liver, even in a dog which has been previously

[1] Jour. Phys., July 18, 1895, p. 277.
[2] Pflüger's Arch., Bd. lxii. p. 335.
[3] Ibid., p. 379.
[4] Arch. de Phys., Jan., 1896, p. 154.
[5] Epiceriticism; Brit. Med. Jour., Feb. 22, 1896.
[6] Edinb. Med. Jour., Feb., 1896.
[7] Pflüger's Arch., June 27, 1896, p. 613.
[8] Ibid., Bd. lxi., p. 551.

made diabetic by excision of the pancreas (Kaufmann[1]). Kaufmann,[2] while laying stress upon the liver as a sugar-forming organ, adopts the somewhat peculiar view that the larger part of the carbohydrate stored in the hepatic cells leaves the liver in the form of glycogen, which he easily finds in the plasma of diabetic dogs.[3] [Livierato and Lépine had already asserted its presence in small quantities in normal blood-plasma.] Dastre,[4] on the contrary, believes that this glycogen really belongs to the corpuscles. [And we think it can be confidently assumed that our present methods do not permit of the estimation of small quantities of glycogen with the accuracy which would be necessary to lend weight to Kaufmann's contention.] Kaufmann finds no support in his results for the view that in **diabetes** there is a diminution in the power of the organism to burn sugar. [But he seems to lose sight of the fact that in pathologic diabetes the behavior of the cells in presence of the sugar offered to them is certainly altered; and it is difficult to explain, on any other hypothesis than a change in their oxidative power, why in diabetes levulose should be burned in the body and dextrose excreted in the urine.] The discovery that in phloridzin diabetes (in rabbits) dextrose may be used up in large quantities (Lusk[5]) [only serves to accentuate the difference between this condition and pathologic diabetes. Indeed, so far is it from being certain that the drug has the same point of attack as the disease that] Zuntz,[6] after a survey of the literature, sums up by saying that phloridzin may quite possibly produce its effects by direct action on the renal epithelium.

Energy of Muscular Work.—[The source of the energy of muscular work is still the subject of keen debate. Pflüger has proved beyond all doubt that on an almost purely proteid diet (in a dog) work is done at the expense of the energy of proteid substances. But while it is true that on a mixed diet like the ordinary food of man somewhat more proteid may be used up during work than in repose (6 to 27% more in recent experiments by Krummacher),[7] it may be looked upon now as common knowledge that the greater part of the energy must come from the nonproteid food.] It is still open, however, to Pflüger to maintain, as one of his pupils (Schenck)[8] has lately done, that although the carbohydrates may very well be sources of muscular energy, they are never the *immediate* sources; that it is the organized "living proteid" molecule which actually breaks down in contraction; and that its nitrogenous nucleus is again regenerated to "living proteid" by union with nonproteid elements, and its store of energy recruited at their expense. Kaufmann's statement[9] that the amount of urea in the blood is not increased in passing through a muscle either during rest or activity [even if we could put any confidence in results that turn upon the estimation of minute quantities of urea] would prove little either for or against the position of Pflüger; while it is certainly true, as Speck[10] says, in bringing a long investigation to a close,

[1] Arch. de Phys., Jan., 1896, p. 151.
[2] Compt. rend. Soc. de Biol., 1895, p. 277.
[3] Centralbl. f. Phys., July 27, 1895.
[4] Ibid.
[5] Yale Med. Jour., Mar., 1896.
[6] Arch. f. (Anat. u.) Phys., 1895, p. 570.
[7] Zeit. f. Biol., Bd. xxxiii., 1896, p. 108.
[8] Pflüger's Arch., Bd. lxi. p. 535.
[9] Centralbl. f. Phys., Sept. 21, 1895, p. 408.
[10] Arch. f. (Anat. u.) Phys., 1895, p. 463.

that "the researches of Pflüger show, indeed, that proteid *may* be [under all circumstances] the source of muscular energy, not that it *must*." [The most probable outcome of the whole discussion would seem to be that in this matter the organism is not controlled by hard-and-fast rules—by laws of the Medes and Persians which alter not—but that the living framework of the muscle, in which proteid is always an essential element, utilizes for contraction the materials that come most ready to its hand—nitrogen-free food *par excellence*, when, as in ordinary circumstances, this is abundantly offered to it; nitrogenous food when, as in an animal on a purely proteid diet, this is present in excess. As to the precise form in which the nonnitrogenous substances, whose combustion, on any hypothesis, plays ordinarily a most important part in muscular contraction are used up in the muscle] Seegen[1] has shown by calculation for the voluntary contraction of skeletal muscle, as Stewart[2] had previously done for the heart, that it is impossible to consider the muscular glycogen as an important source of muscular energy. The quantity present is too scanty, its disappearance too slow, and its renewal too tardy. On the other hand, Seegen[3] has made the paradoxical observation—which, however, has been criticised by Schenck[4]—that in a muscle tetanized artificially *more* glycogen disappears than corresponds to the amount of work done. [From this Seegen draws, curiously enough, the same conclusion as from the other set of experiments, in which too little glycogen was used up, viz. that glycogen cannot be the source of muscular energy—a conclusion certainly correct, but as certainly illogical.] Although it is not to be doubted that one of the most important substances used up in muscular contraction is sugar, the statement of Mosso, Harley,[5] and others, that sugar increases the capacity for muscular work, would still seem, in the light of the experiments of Langemeyer and Stokvis,[6] to await confirmation. Even when it has been proved, it must still be shown, before we can speak of sugar as "peculiarly a food for muscle," that this action differs from the action of caffein and cocain, which also, according to Sobieránski,[7] increase the muscular power, as measured by the ergograph.

Animal Heat.—Kaufmann[8] has measured simultaneously, for the first time (in dogs), the heat given off and the CO_2 and N eliminated. He professes to have made out that when, during digestion, sugar enters the blood in abundance, fat is plentifully formed, almost entirely from the proteid whose N is found in the urine. The greater part of the heat produced is derived from the oxidation of the sugar. When, during digestion, albumin enters the blood in abundance, it is immediately split up into fat, urea, CO_2, and H_2O. The greater part of the heat produced is in this case derived from the oxidation which transforms the albumin into fat, a smaller portion from the partial

[1] Centralbl. f. Phys., June 27, 1896, p. 189.
[2] Manual of Physiology, London, 1895, pp. 511, 512.
[3] Centralbl. f. Phys., June 27, 1896, p. 185, and Arch. f. (Anat. u.) Phys., 1895, p. 242.
[4] Pflüger's Arch., Bd. lxi. p. 535.
[5] Brit. Med. Jour., Nov. 23, 1895, p. 1282.
[6] Ibid., p. 1280.
[7] Gazeta lekarska, 1896.
[8] Arch. de Phys., Apr., 1896, pp. 329, 341.

oxidation of this fat. [Kaufmann's conclusions appear to us to be too "diagrammatic." The length of each experiment (5 hours) was too short, especially for the N-determinations, and the feces were altogether neglected.]

Pembrey and Hale White[1] assert that in hybernating animals the regulation of temperature is chiefly brought about by alterations in the production of heat in the muscles. Incidentally, they make the statement that the contraction of cardiac muscle is probably a much more economical process than the contraction of skeletal muscle—work, and not the production of heat, being the function of the former. [But, so far as we know, there is no foundation for assuming such a difference.]

Nitrogenous Metabolites.—*Urea.*—Schöndorff[2] by means of a new [and important] method finds that the organs (of the dog) contain, with the exception of the muscles, heart, and kidneys, nearly the same percentage of urea as the blood. In the blood the urea is uniformly distributed over corpuscles and serum. A most interesting result is the presence of urea in muscles.

Uric Acid and Xanthin-bases.—Krüger and Wulff[3] have founded a method for the quantitative estimation of the so-called alloxur bodies (uric acid + xanthin-bases) upon the fact that the xanthin-bases are precipitated along with uric acid by cupric sulphate and sodium bisulphite. If from the total N in this precipitate, estimated by Kjeldahl's method, the N belonging to the uric acid, as determined by the Ludwig-Salkowski method, is subtracted, the remainder gives the N belonging to the xanthin-bases, which in 19 analyses was found to vary from $\frac{1}{2}$ to $\frac{1}{7}$ of the N in the uric acid. Camerer,[4] while accepting nuclein as the forerunner of uric acid, in accordance with the researches of Horbaczewski, finds that the increase of uric acid and xanthin-bases in the urine after a meal is not to be wholly ascribed to the leukocytosis and consequent increase in the number of white blood-cells broken down during digestion. Some of the uric acid is derived from the nuclein of other cells, some from the nuclein of the food. In leukemia and in gout, according to Kolisch,[5] the increased formation of uric acid and xanthin-bases is also connected with the increase in the amount of nuclein set free from the broken-down leukocytes.

Fat.—Using the method of Dormeyer,[6] in which the tissue is subjected to gastric digestion before extraction with ether, Steil[7] finds that the percentage of fat in lean meat assumed by Voit in his extensive researches on metabolism is too low, and that Voit's results, therefore, require correction. Noël Paton[8] has investigated the relationship of the liver to fats. He brings forward evidence that fatty acids are formed in the liver from glycogen, but he finds no support for the old view that fat can be directly formed from proteids—a view

[1] Jour. Phys., May 30, 1896, p. 477.
[2] Pflüger's Arch., Bd. lxii. pp. 1, 332, and ibid., Bd. lxiii. p. 192.
[3] Zeit. f. Physiol. Chem., xx. p. 176.
[4] Zeit. f. Biol., xxxiii., 1896, p. 139.
[5] Wien. klin. Woch., 1895, Nos. 23, 24, and 45.
[6] Pflüger's Arch., Bd. lxi. p. 341.
[7] Ibid., p. 343.
[8] Jour. Phys., Mar. 6, 1896, p. 167.

which Pflüger has recently subjected to adverse criticism, and which is also opposed to the experiments of Kumagawa and Kaneda.[1]

Iron.—The perennial question whether inorganic iron can be absorbed has been again attacked by Kunkel,[2] and answered [in our opinion decisively] in the affirmative. Hall[3] has actually been able, by microchemic tests, to trace an organic preparation of iron (carneferrin) from the intestine into the epithelium of the villi. Thence it passes into the blood of the portal vein, is partly used in the formation of Hb, and partly accumulates in the spleen and liver. Finally, Woltering[4] seems to have given the death-blow to Bunge's theory, that inorganic salts of iron only cause indirectly an accumulation of iron in the liver by uniting with the H_2S in the alimentary canal, and thus "sheltering" the organic iron of the food and permitting its absorption. For when $FeSO_4$ is given to rabbits, iron accumulates in the liver, but not when salts of manganese, which equally unite with H_2S, are substituted. Stockman,[5] making careful estimations of the quantity of iron in a number of actual dietaries, concludes that the greater part of it must be retained in the body and used over and over again. Stühlen[6] finds that the liver is especially rich in iron in pernicious anemia, and Auscher and Lapicque[7] have discovered in various organs in a case of pigmentary diabetes a hydrate of iron united with a very small quantity of organic matter.

Dietetics.—Ellinger[8] in view of Paal's[9] observations on the molecular weight of certain proteid substances, attempted to determine whether the organism has the power of making a synthesis of the large albumin molecule out of the comparatively small molecules of antipeptone. He concludes that this is not the case. On the other hand, according to Ganz,[10] more than half of the total N required can be given in the form of Paal's glutin-peptone [perhaps, if Ellinger is correct, in virtue of the hemipeptone in it. For the rest, although it is certain that peptones and albumoses consist of smaller molecules than albumin, it can hardly be said that we know definitely their relative, much less their absolute, molecular weights. Thus, while Paal gives the molecular weight of albumose at 1200 or 2100, and Sabanejeff that of egg-albumin at 14,000, Sjöqvist[11] gives 800, 600, and 250 as the molecular weights respectively of egg-albumin, albumose, and peptone.]

The Urine.—An attempt has been made by v. Sobieránski,[12] on the strength of a reinvestigation of the microscopic appearances presented by the kidney after injection of pigments into the blood, to revive Ludwig's theory of urinary secretion. Under no circumstances does he find the pigment-granules near the attached bases of the renal epithelium, but always near the lumen of the tubules; from which he concludes that the pigment is not passed

[1] Centralbl. f. Phys., Feb. 22, 1896, p. 721. [2] Pflüger's Arch., Bd. lxi. p. 595.
[3] Arch. f. (Anat. u.) Phys., 1896, p. 49. [4] Zeit. f. Physiol. Chem., xxi. p. 186.
[5] Jour. Phys., Nov. 16, 1895, p. 484. [6] Deutsch. Arch. f. klin. Med., 1895, p. 248.
[7] Arch. de Phys., Apr., 1896, p. 390. [8] Zeit. f. Biol., xxxiii., 1896, p. 190.
[9] Ber. d. Deutsch. chem. Ges., Bd. xxvii. p. 1827.
[10] Sitz. d. Physik.-med. Soc. in Erlangen, H. 26, p. 47.
[11] Skand. Arch. f. Phys., v. p. 277. [12] Arch. f. exp. Path. u. Pharm., xxxv. p. 144.

through the cells from the blood, but absorbed by them from the tubules after excretion through the glomeruli.

For the **clinical estimation of sugar in the urine** Lohnstein[1] recommends the following method [which appears to be based on sound principles, extremely convenient, and sufficiently accurate]: Add to about 50 c.c. of urine about 2 g. of yeast. Stir up, and determine the specific gravity of the suspension. Then pour into a flask, put in a cotton plug, and leave for 24 hours at 20–25° C. After fermentation is complete again determine the specific gravity. From the difference the quantity of sugar can be calculated. A special urinometer[2] is required.

Mörner[3] finds in every so-called normal urine a small amount of serum-albumin, the reactions of which, however, may be obscured by the presence of certain proteid-precipitating substances—*e. g.* nucleic acid. Albumosuria, according to Krehl and Matthes,[4] is most frequently, though not always, associated with fever. When the fever disappears the urine becomes free from albumose.

Abel[5] has discovered in the urine of the dog a volatile substance, with a penetrating odor, which contains sulphur, and which he has shown to be ethyl sulphide. It is absent from the feces, and is probably a product of normal metabolism. One or more closely-related substances (mercaptans) have been partially isolated by Aldrich[6] from the secretion of the anal glands of Mephitis mephitica (the common skunk).

DIGESTION AND ABSORPTION.

Gastric Digestion.—Moritz[7] states that the slight positive pressure (2–16 mm. of water in the sitting posture) which normally exists in the human stomach is chiefly due to the weight of the viscera, especially the liver, but in part also to the variable tonic contraction of the gastric walls. The pyloric end is the essentially motile part of the stomach, the fundus usually remaining at rest. In company with a chorus of other authors (Meltzer,[8] Goldschmidt,[9] etc.), Moritz asserts that faradic electricity has practically no effect on the movements of the stomach. Meltzer extends this conclusion to the intestines. His experiments lend no support to the idea that the movements of the alimentary canal can be influenced therapeutically by faradization.

Gastric Juice.—Schüle[10] finds that (in man) both the free and the combined HCl and the total acidity of the gastric juice undergo great variations even in the same (normal) individual without evident cause. It was not possible to raise the acidity distinctly even by the administration of as much as 1.4 g. HCl by the mouth. This is quite in accordance with the conclusions of Winter and Koeppe. Winter[11] says there should no longer be a question

[1] Pflüger's Arch., Bd. lxii. p. 82.
[2] Made by L. Reimann, Berlin, S. O.
[3] Skand. Arch. f. Phys., vi. p. 332.
[4] Deutsch. Arch. f. klin. Med., 1895, p. 501.
[5] Zeit. f. Physiol. Chem., xx. p. 252.
[6] Jour. Exper. Med., vol. i. p. 323.
[7] Zeit. f. Biol., xxxii., 1895, p. 313.
[8] Centralbl. f. Physiol., July 13, 1895.
[9] Deutsch. Arch. f. klin. Med., Dec., 1895.
[10] Zeit. f. klin. Med., xxviii. and xxix. p. 87.
[11] Loc. cit.

of excess or deficiency of HCl as a fundamental cause of dyspepsia. It is the total Cl, not the HCl merely, which is important, and all other dissolved molecules (sugar, peptones, etc.) take part in the digestive cycle. Only the molecules of Cl here, as in all animal liquids, are numerically preponderant. Koeppe[1] has given a novel view of the formation of HCl in the stomach. He believes that it is formed, not in the depths of the gland-cells, but at the surface of contact of the stomach-wall with the gastric contents, and that its source is none other than the NaCl of the food. The evidence adduced in favor of this view is very strong—*e. g.* when the chlorids are prevented from entering the stomach (v. Mering) no free HCl is found in it, not even after the injection of HCl into a vein. When NaBr or NaI is administered by the mouth, HBr or HI, acids analogous in constitution to HCl, appear in the gastric contents. Winter[2] also considers that his own results are a heavy blow to the theory of the intracellular formation of HCl.

Intestinal Digestion.—Nuttall and Thierfelder[3] have shown that by adopting elaborate precautions the alimentary canal of a guinea-pig, taken by Cesarean section from its mother's uterus and fed in an aseptic space on sterile milk, can be kept free from bacteria. The animal grew apparently as fast as one of its sisters which was brought up in the orthodox microbic way. With the success of this brilliant experiment the suggestion of Pasteur, that the presence of bacteria in the alimentary canal is necessary for digestion falls to the ground, at least so far as an animal diet is concerned.

From a study of the comparative anatomy of the bile- and pancreatic ducts in a large number of mammals Rachford[4] has made certain generalizations favorable to his theory of the mutual action of bile and pancreatic juice in the digestion of fats;[5] *e. g.* that a gall-bladder is necessary in animals whose food contains a considerable quantity of fat. [But Rachford does not bring into harmony with this conclusion the facts that among rodents the herbivorous rabbit, beaver, and porcupine possess a gall-bladder, which, on his hypothesis, must be to them an elegant superfluity, while the omnivorous rat has none, and that among the herbivorous ruminants the ox, goat, deer, and sheep are furnished with a receptacle for bile, while the camel, giraffe, and dromedary have to carry on the business of digestion without it.]

Pregel[6] asserts that in the intestinal juice of the sheep a large amount of urea (as much as 0.248%) is present. [This statement must be received with reserve. One of his qualitative tests was the formation of the rhombic crystals of nitrate of urea. But without careful measurement of the angles this may be a very fallacious test.] Mendel[7] concludes [with good reason, we believe] that the so-called "paralytic secretion," after section of the intestinal nerves, is a true secretion and not a mere transudation.

Alcohol and Digestion.—The influence of alcohol, in various forms,

[1] Pflüger's Arch., Bd. lxii. p. 567.
[2] Loc. cit.
[3] Arch. f. (Anat. u.) Phys., 1895, p. 559.
[4] Medicine, Dec., 1895.
[5] Cf. Rachford and Southgate, Med. Rec., N. Y., Dec. 21, 1895.
[6] Pflüger's Arch., Bd. lxi. p. 359.
[7] Ibid., Bd. lxiii. p. 425.

on artificial digestion, has been carefully studied by Chittenden and Mendel.[1] Alcohol in small amount (1 or 2% of absolute alcohol) does not diminish, and may even slightly increase, the activity of gastric digestion, and retardation is not very marked until 5 to 10% is reached. Strong alcoholic beverages retard gastric digestion in proportion to the quantity of alcohol present. With gastric juice in which the ferment is markedly active the presence of even 10% of whiskey, brandy, rum, and gin causes only a slight retardation, but with a weak gastric juice the effect is much more distinct. With 20% of whiskey the activity of the juice may be reduced ¼. Wines, as a class, hardly hinder gastric digestion, except in virtue of the solids contained in them. The same is true of malt liquors. On the proteolytic powers of the pancreatic juice absolute alcohol, whiskey, rum, and brandy have more effect than on the gastric juice. Wines, on account of the acids contained in them, retard pancreatic digestion much more powerfully than do the strong alcoholic liquors. On salivary digestion of starch wines have a similar effect and for the same reason.

RESPIRATION.

Schumburg and Zuntz,[2] with the view of elucidating the much-debated question of the cause of "mountain-sickness," have investigated the gaseous exchange during rest and work at 4 different levels, varying from 42 m. above the sea (Berlin) to 3800 m. (on Monte Rosa). While admitting that a final explanation is only possible after experiments more numerous and more varied, they bring forward strong evidence that changes in the mechanics, and not merely changes in the chemistry of respiration, are concerned. [And in this attitude of compromise we think they are right.] *E. g.*, they find that there is something not connected with the want of oxygen, which at high altitudes diminishes the capacity for muscular work, and at the same time affects the mechanics of respiration, while for a given amount of work an abnormally large consumption of oxygen is required. This "something" they suggest is the peculiar excitation of the nervous system in the fierce light of those high levels, which acts not only on the retina, but on the skin, and may even affect the distribution of the blood. [In this connection we may remember that, according to Tangl,[3] maximal stimulation of vasomotor nerves actually leads to changes in the gaseous metabolism.] The same stimuli, they think, may be the cause of the increase in the number of the red blood-corpuscles which is known to occur at high altitudes. Fick,[4] however, suggests that there are more corpuscles because they live longer when, so to speak, the wear and tear are lessened in consequence of the slower absorption of oxygen. That mere diminution of atmospheric pressure, as such (even to $\frac{1}{25}$ atmosphere), has no stimulating effect upon the neuromuscular system has been shown (for the frog) by W. Rosenthal.[5]

[1] Am. Jour. of Med. Sci., Jan.–Apr., 1896.

[2] Pflüger's Arch., Bd. lxiii., May 30, 1896, p. 461.

[3] Ibid., Bd. lxi. p. 563.

[4] Ibid., Bd. lx. p. 589.

[5] Arch. f. (Anat. u.) Phys., 1896, p. 1.

Haldane[1] has made an important contribution to our knowledge of the modus operandi of carbonic-oxid poisoning. The gas acts solely in virtue of its affinity (140 times greater than that of O) for Hb, which is thus rendered incapable of taking up O. Distinct symptoms are produced when the amount of CO in the air reaches about .05%. At .2% the symptoms become urgent. Since the time required for the symptoms to appear is [inversely] proportional to the rate of respiratory exchange per unit of body-weight, and is therefore much less in small than in large animals, he suggests that a mouse might be used as an "indicator" in a dangerous coal-mine. The poisonous action of CO diminishes as the partial pressure of O increases, and at a pressure of 2 atmospheres of O it is abolished in the case of mice, because the amount of O *dissolved* in the plasma is sufficient to sustain life.

A most interesting discussion has been carried on between Filehne and Kionka[2] on the one hand, and Zuntz and Geppert[3] on the other, as to the precise mechanism of the increase in the respiratory movements during muscular work. [Everybody is agreed that an increase in the respiratory movements is caused by tetanizing muscles whose nervous connections have been severed. Clearly, then, some alteration in the blood passing through the active muscles (the addition of certain hypothetical waste-products, according to Zuntz and Geppert) is concerned in the stimulation of the respiratory center.] And Zuntz and Geppert maintain that there are no grounds for the assumption that in the intact organism the changes are brought about in any other way. Filehne and Kionka hold it to be obvious that the increased "venosity" of the blood coming from the contracting muscles will directly affect the respiratory center. They assert, however, that when the muscular nerves have been cut tetanus causes a diminution of O and an increase of CO_2 in the arterial blood, while with intact nerves (as Zuntz and Geppert stated long ago) the arterial blood is even better oxygenated during tetanus than during rest. They therefore consider [and there seems no escape from this conclusion if the gas-estimations of Filehne and Kionka are accepted] that it is the function of some of the afferent muscular nerves to act upon the respiratory center so as to ensure that during contraction the supply of O shall *at once* become adequate to the demand.

Intercostal Muscles.—Masoin and Réné du Bois-Reymond[4] state that the intercartilaginous portions of the internal intercostal muscles take no part in ordinary breathing, but contract (simultaneously with the diaphragm, and therefore in the inspiratory phase) in forced respiration. Weidenfeld[5] makes the sweeping statement that the intercostal muscles as a whole take no part in respiration.

THE NERVOUS SYSTEM.

Spinal Cord.—Goltz and Ewald[6] have been able to keep dogs alive for

[1] Jour. Phys., July 18, 1895, p. 201, and Nov. 16, 1895, p. 430.
[2] Pflüger's Arch., Bd. lxii. p. 201, and Bd. lxiii. p. 234. [3] Ibid., Bd. lxii. p. 295.
[4] Arch. f. (Anat. u.) Phys., 1896, p. 85. [5] Centralbl. f. Phys., Nov. 30, 1895, p. 550.
[6] Pflüger's Arch., Bd. lxiii., May 13, 1896, p. 362.

long periods after preliminary section of the cord in the cervical region and subsequent removal of large portions of it. They find that even after destruction of the lumbar and sacral regions of the cord the external sphincter of the anus, striped and even voluntary muscle though it be, retains its tone, although this is temporarily lost after the first cervical section. The bladder ultimately recovers the power of emptying itself spontaneously and at regular intervals. A pregnant bitch from which the lumbar enlargement and the whole cord below it to the cauda equina had been removed, and therefore all the nerve-roots supplying fibers to the uterus cut, whelped in a normal manner, and the corresponding mammary glands behaved exactly as the rest. Digestion went on as usual when practically nothing of the cord except its cervical portion was left. Certain vasomotor phenomena were also observed which suggest that the sympathetic system, independently of the cerebrospinal system, is itself possessed of regulative powers. The authors consider the most important outcome of their experiments to be the proof that in the higher animals the principal vital processes are decentralized. [And there can be little doubt that the fashion of distinguishing as a "center" every area of gray matter the experimental stimulation of which gives rise to any recognizable reaction, however diffuse or vague, has tended to obscure our conception of the nervous system as a coordinated *system*, and not a mere loose aggregate of centers and paths.]

Homolateral Pyramidal Fibers.—Dejerine and Thomas [1] have demonstrated, as they believe for the first time in man, by an exhaustive histologic study of 7 cases of complete degeneration of the pyramidal tract, the existence of fibers which pass down from the pyramid to the lateral pyramidal tract of same side. [These fibers are of great interest, as their existence affords an explanation of the well-known clinical fact that associated bilateral muscles escape in hemiplegia.]

Reflex Action.—Pándi [2] enters a plausible plea in favor of the view that under normal conditions all reflex phenomena are essentially cortical. [Although his explanation, on this theory, of some of the clinical and experimental facts on which he bases his argument seems occasionally to be somewhat forced, it cannot be denied that physiologists, and even physicians, have often been too ready to apply phenomena seen in the decapitated frog to the circumstances of the intact human organism.] And such facts as the disappearance of the patellar reflex after pathologic lesions high up in the cord (Bastian), and its marked impairment after high section of the cord in dogs (Gad and Flatau [3]), are not easily reconciled with the ordinary doctrine.

According to Burdon Sanderson,[4] who has studied the electric changes that occur in the reflex spasm of strychnin-poisoning, the spasm is not, as has been supposed, a tetanus, but a series of brief continuous contractions.

Brain.—V. Monakow [5] has continued his exhaustive study of the 'tween

[1] Arch. de Phys., Apr., 1896, p. 277.
[2] Pflüger's Arch., Bd. lxi. p. 465.
[3] Neurolog. Centralbl., 1896, No. 4.
[4] Jour. of Phys., Sept. 5, 1895, p. xxxv.
[5] Arch. f. Psych., xxvii. p. 386.

brain (the region of the third ventricle) by the aid of carefully-selected pathologic material. He believes that in man, as in animals, each of the nuclei of the optic thalamus is connected with a definite region of the cerebral cortex in such a way that destruction of the cortical area leads to degeneration of the corresponding nucleus. Physiologically, some, at any rate, of the nuclei of the thalamus are to be considered as stations through which regulative centrifugal impulses are handed on to certain areas of the cortex. Castellino[1] concludes, from experiments on animals, that it is the motor cortical centers with which the thalami are specially connected, and that they have to do with the so-called muscular sense. [But it seems, to say the least of it, a somewhat crude and unphilosophical mode of expression to speak of the thalami as "the organs with which we judge the distance of surrounding objects."]

Vitzou[2] makes the announcement that a **regeneration of nerve-cells** has been observed by him in a monkey whose occipital lobes had been removed. [In view of the almost universal belief that nerve-cells are never regenerated confirmation will be eagerly awaited.]

H. Munk[3] has endeavored to bring the **contractures** produced in monkeys after operations on the cerebral cortex into relation with the contractures observed in pathologic cases in man. He distinguishes two groups of contractures—one in which the cause lies in a more or less permanent excitation of the related cortical areas when they have been incompletely removed, and another seen only after total extirpation of the areas. The first corresponds to the primary, and the second to the paralytic or secondary, contractures in man.

Rethi[4] and Carpenter[5] have studied the topography of the "chewing center" in the rabbit, and Ott[6] has localized (in the cat) a detrusor center for the bladder in the cerebral peduncles.

Trophic Nerves.—Krause,[7] from the results of excision of the Gasserian ganglion and the portion of the trigeminus lying central to it, comes to the conclusion that the so-called trophic influence of the nerve does not exist. W. A. Turner[8] describes experiments performed by Ferrier and himself which have led to a similar result. [And in our opinion the matter is definitely settled in this sense.] Krause found that sensation (touch, temperature, etc.) is after a time partially restored in the region supplied by the nerve.

Barker[9] has made a careful study of a remarkable circumscribed unilateral sensory paralysis (in himself), due perhaps to the pressure of a cervical rib.

The Sympathetic.—Langley[10] continues his observations in this field, which he may almost be said to have made his own. He finds evidence that the nerve-fibers in the cervical sympathetic regenerate after section. Not only so, but the fibers from each spinal nerve-root make junction with their proper

[1] Wien. med. Woch., Aug. 3, 1895.
[2] Compt. rend. d. l'Acad., Sept. 16, 1895.
[3] Arch. f. (Anat. u.) Phys., 1895, p. 565.
[4] Sitz. d. Kais. Akad. zu Wien., cii. Abth. iii.
[5] Centralbl. f. Phys., July 27, 1895, p. 337.
[6] Ibid., July 13, 1895, p. 335.
[7] Münch. med. Woch., No. 25, etc., 1895.
[8] Brit. Med. Jour., Nov. 23, 1895.
[9] Jour. of Exper. Med., vol. i. p. 348.
[10] Jour. of Phys., July 18, 1895, p. 280, and June 6, 1896, p. 55.

nerve-cells in the superior cervical ganglion; *e. g.* the fibers that enter the cervical sympathetic from the fourth thoracic nerve pick out the nerve-cells supplying the blood-vessels and hairs, and by no chance unite with nerve-cells sending fibers to the pupil. Langley and Anderson[1] have investigated in great detail the innervation of the pelvic and adjoining viscera. Huber[2] has studied by Golgi's method the innervation of the submaxillary and sublingual glands, and has confirmed the results of Langley and Berkley.

THE SENSES.

Hearing.—Strehl,[3] in a sort of physiologic *causerie* containing the results of experiments by 5 observers, produces evidence that pigeons do not hear after extirpation of both membranous labyrinths, and that the apparent reaction to sounds is to be attributed to the stimulation of tactile nerve-endings in the skin. Wundt,[4] on the other hand, defends the original view of Ewald, that the pigeons actually hear, against the attack of Bernstein,[5] although he finds the range of audible sounds narrower than in the normal bird. Wundt lays stress upon the observation that much more violent, but noiseless, vibrations of the air set up by bellows caused no reaction. [But to this it is possible to reply that it may be only periodic vibrations, and perhaps even periodic vibrations of a certain range of frequency, which are fitted to stimulate the hypothetical tactile end-organs.] And Strehl has actually shown that it is easy to cause tactile sensations in man by musical sounds; while Kreidl[6] comes to the conclusion that goldfish, though deaf to musical sounds, react, through a special cutaneous sense, to loud noises.

Equilibration.—Ewald[7] has made the curious observation that the labyrinth (in rabbits) influences the course of rigor mortis in the striped muscles. Rigor does not come on so soon on the side on which the labyrinth has been removed. While putting forth no theory in explanation of this remarkable fact, he points to it as in favor of his view that the labyrinth exercises a constant influence on all striated muscles.

Strehl,[8] while admitting that in certain animals (birds and, perhaps to a less extent, fishes) the labyrinth has to do with orientation, concludes from observations on deaf-mutes, in opposition to Breuer and Kreidl, that any such function which it may possess in man is of extremely little importance. The cause of galvanic vertigo he finds [and, in our opinion, rightly] not in any action of the current on the labyrinth, but in its action on some portion of the brain.

V. Bechterew,[9] in an investigation which crosses the border-line between physiology and psychology, has been led to the belief that the impressions received by the cerebral organs of equilibration from the skin and muscles,

[1] Jour. of Phys., Dec. 30, 1895, p. 71, and May 5, 1896, p. 372.
[2] Jour. of Exper. Med., vol. i. p. 282.
[3] Pflüger's Arch., Bd. lxi. p. 205.
[4] Ibid., p. 339.
[5] Ibid., p. 113.
[6] Ibid., p. 450.
[7] Ibid., Bd. lxiii. p. 521.
[8] Loc. cit.
[9] Arch. f. (Anat. u.) Phys., Mar. 26, 1896, p. 105.

and which underlie the sensations that acquaint us with the position of the limbs, etc., are the chief foundations of our conceptions of space.

Sight.—Einthoven[1] has determined the cardinal points of the eye for light of various wave-lengths. E. Müller[2] has confirmed the remarkable observations of Wolff, that after extraction of the lens in triton larvæ a new lens is formed from the iris epithelium.

Schenck and Fuss[3] show [conclusively, we think] that a phenomenon observed by Dogiel (constriction of the *opposite* pupil on stimulation of the cervical sympathetic) is only an illustration of the well-known fact that when the amount of light falling on one retina is increased the pupil of the other eye contracts.

Retina.—Weinland[4] has attempted, for the first time, to form a theory of vision which takes account of the newer histological discoveries. The details cannot be reported here, and it must suffice to say that he considers the sole visual material to be contained in the pigmented epithelium. By the action of light the epithelial cells alter their volume and so press upon the cones. In this way impulses are set up in the optic nerve.

Color-blindness.—V. Kries[5] in an interesting study of 20 cases of congenital partial color-blindness brings forward strong evidence that the red-green blind can be divided, as regards the comparison of red (lithium) and orange (sodium) light, into two sharply-separated groups—a result which is emphatically in favor of the Young-Helmholtz theory and against the theory of Hering. Peddie[6] reports a remarkable case of color-blindness in which there is, strictly speaking, blindness to all colors except red. Yet the case is not one of monochromasy, but of dichromasy, for all the tests show that there is a neutral point in the yellow portion of the spectrum, and that the colorless light of the green and blue portions is complementary to the red.

Röntgen Rays.—Axenfeld[7] makes the announcement [confirmation of which will be awaited with interest] that the Röntgen rays appear to be perceived by insects. [In the mean time, we believe that the facts, so far as reported, will hardly permit us to substitute, as the author does, "seen" for "perceived."]

Temperature Sensations.—Kiesow[8] finds that the "heat" and "cold" points of Blix, etc., once fixed, remain constant for 4 weeks and more. The "heat" points react to all stimuli, including a cold object, with a specific sensation of heat, but the greater number of the "cold" points also give a sensation of heat when touched with a warm object.

[1] Pflüger's Arch., Bd. lxii. p. 166.
[2] Arch. f. mikr. Anat., xlvii. p. 23.
[3] Pflüger's Arch., Bd. lxii. p. 494.
[4] Neue Untersuch. u. d. Functionen der Netzhaut, etc., Tübingen, 1895.
[5] Centralbl. f. Phys., June 13, 1896, p. 148.
[6] Trans. Roy. Soc. Edinb., 1896, p. 501.
[7] Centralbl. f. Phys., June 13, 1896, p. 147.
[8] Wundt's Philos. Studien, xi. p. 135.

MEDICAL JURISPRUDENCE, HYGIENE, AND CLINICAL CHEMISTRY.

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Entomology in Medical Jurisprudence.—The insects found on buried corpses are not of very numerous varieties, especially in the case of a very young body, whose tissues decompose rapidly. Mégnin has shown that the mortuary insects differ on bodies *buried* at different times, and that they are not the same as those found on dead bodies in the open air. He has recognized 8 species, which succeed each other in regular order and with a rapidity which depends on the condition of the medium and on atmospheric influences. A fetus buried about 1 month was examined by Dr. Mingaud[1] of Nîmes. The weather had been dry and hot, and decomposition had been active, yet he was able to fix accurately the date of the burial of the body by identifying with the microscope certain species of insects found upon the body. This development of entomology offers to medical jurisprudence an entirely new method of determining dates of death and burial.

Damages for Malpractice.—Sharp[2] reports that suit having been brought in West Virginia against two physicians for causing the death of a woman through an abortion and subsequent celiotomy for the removal of an ovarian cyst, the court held that the operations in question were "personal transactions," and that "the defendants could not testify as to anything said by them or done by them or others in her (the dead woman's) presence, or as to the condition of the patient as they found it, or anything occurring when she was present." Death having sealed the lips of one party to the transaction, it was held that the law should seal the lips of the other parties. Such a decision leaves the physician and surgeon absolutely unprotected. The jury disagreed.

Consent of the Widow necessary to Authorize an Autopsy on the Body of her Deceased Husband.—"A surviving wife is entitled to the possession of the body of her deceased husband in the same condition as when death occurred for the purpose of giving it proper care and burial, and she may sue for damages a physician or other person who, without her consent, unlawfully or wantonly dissects or mutilates the body before burial" (Foley *vs.* D., 37, N. Y. S. 471, 1896).[3]

The Law of Infanticide.—Glaister[4] says the status of jurisprudence

[1] Jour. de Méd. de Paris, Feb. 23, 1896. [2] Jour. Am. Med. Assoc., June 6, 1896.
[3] Internat. Med. Mag., May, 1896.
[4] Edinb. Med. Jour., July, 1895, quoted in Boston M. and S. Jour., Feb. 20, 1896.

relating to infanticide is such that a woman who kills her offspring before delivery is complete may escape the law. The civil rights of an unborn heir are recognized when its prospective inheritance is concerned, but its mother may murder it during parturition, provided she does not conceal her pregnancy or the child's birth. The burden of proving that the child was not born dead, or that it was killed after it had been wholly born, rests upon the State, and the accused gets the benefit of the doubt. More effectual legislation in this regard is needed. Glaister thinks that evidence of violence on an infant's body, whether the child were dead or not when injured, should entail severe punishment on the perpetrator, and that in cases in which the child has breathed at all, whether fully born or not, there should be the presumption of a "live birth" allowed.

Detection of Blood-stains in Medico-legal Cases.—Iron prevents the formation of hemin crystals. Hydrogen peroxid, added to a slight scraping of the suspected blood-substance previously softened by feebly alkaline water, causes an evolution of oxygen if blood be present.[1]

Hypnotic Confessions.—Maggie B——, having confessed to false testimony in a murder case, and having accused herself of the deed, was hypnotized by Dr. Callen. The woman was dying of consumption. Under hypnosis she stated that her first statements were true, and that she did not commit the murder, having confessed to it to shield her son, whom she feared was implicated. "Such attempts are scientifically unjustifiable, since the influence of leading questions producing suggestion cannot be excluded."[2]

The Red Blood-corpuscle in Legal Medicine.—According to White,[3] reliable measurement of blood-corpuscles from blood-stains can generally be made. Should error occur from an imperfect restoration of the form of the hemocytes, the tendency is to make human blood resemble that of lower animals, and not *vice versa*. Mammalian blood can be identified, and the blood of the ox, pig, horse, sheep, and goat can be excluded. Though human blood cannot be distinguished from that of certain other mammals, the confusion of possibilities may be much modified by a good microscopist.

Homicide without External Marks of Violence.—Presbrey[4] reports that a man was found dead in bed with no external marks of violence on his body, with pupils of medium size and equal, and a history of excessive drinking during the previous day and night. His death was attributed to alcohol-poisoning, and the body was buried without an autopsy. Three days later, as there was newly-developed evidence that the deceased had been struck on the head with a fence-paling during a drunken quarrel, the body was exhumed. An autopsy revealed an intracranial clot formed apparently by the laceration of a small vessel. The blow had not felled the man; he had not lost consciousness, but walked home, and was found apparently in a drunken

[1] Med. World, Nov., 1895, quoted in Yale Med. Jour., Apr., 1896.

[2] Alienist and Neurol., Oct., 1895.

[3] Med.-Leg. Jour., Mar., 1895, p. 419, quoted in Boston M. and S. Jour., Feb. 20, 1896.

[4] Boston M. and S. Jour., Apr. 2, 1896.

sleep in an outhouse. He was put to bed (probably in a state of coma) and left to sleep off his drunkenness. He was found dead in the morning, as stated. This was a case in which there was no abrasion, swelling, or any external mark to suggest possible intracranial injury, though death had actually been caused by the unsuspected injury.

The Stomach-test in Murder Trials.—Liebmann[1] says the reliability of tests applied to the solid contents of the stomach with a view to determining the time at which death took place in cases in which the time of the last meal is known depends upon an accurate knowledge of—1. The comparative digestibility of different foods; 2. The amount of food taken, inasmuch as an overloaded stomach digests more slowly than a stomach less distended: 3. The varying degrees of acidity and peptogenic power found in healthy stomachs; 4. The occurrence of psychical influences (fright, grief, joy, etc.) during digestion.

Poison in Expired Air.—Livierato's[2] experiments with the condensed aqueous vapor of the breath of persons with and without disease of the respiratory tract, injected into rabbits, show a toxic action in the liquid obtained from the diseased persons, but no such action in the liquid obtained from healthy persons. The results were the same when the liquid was sterilized.

The Limerick Food-poisoning Cases.—Cameron[3] reports 70 inmates of a boarding-school seriously affected by ptomain-poison, attributed to eating a custard made from eggs which were described as "not quite fresh;" 3 women died from the effects, one 13 days after the seizure.

Lead-poisoning from Public Water-supplies.—Whitelegge[4] says the projectors of every new water-scheme should be obliged to demonstrate whether or not the supply under consideration embodies a plumbosolvent water. Lead-poisoning is a subtle disease, and may do irreparable damage before it is suspected. No water should be used for drinking which contains even a trace of lead. In a small Massachusetts town of scarcely 1500 inhabitants 25 persons exhibited various degrees of lead-poisoning traceable to the public water-supply. Investigation showed in nearly all cases that the water which stood all night in the lead pipes had not been carefully withdrawn and rejected. Lead pipes were used in this town in connecting the houses with the street-mains. The water of this town contained in several instances as much as $\frac{1}{2}$ gr. per gallon, and lead was found in the urine of all patients examined.

The Pollution and Cleansing of Rivers.—Following certain investigations as to the pollution of the river Oker in the Hartz Mountains, Blasius and Beckert[5] conclude that rivers are polluted by domestic fouled water and

[1] Am. Med.-Surg. Bull., Aug. 1, 1895, quoted in Boston M. and S. Jour, 1895, cxxxii. No. 9, p. 207.

[2] Arch. ital. di. Biol., 1895, p. 279, quoted in Am. Jour. Med. Sci., Jan., 1896.

[3] Brit. Med. Jour., July 20, 1895.

[4] Public Health, London, 1895, quoted in Boston M. and S. Jour., Mar. 5, 1896.

[5] Deutsch. Vierteljahrs. f. Gesundheit., 1895, p. 337, quoted in Boston M. and S. Jour. Mar. 5, 1896.

by factory waste; that the self-purifying powers of rivers depend (*a*) upon the extent of the dilution to which the polluting matters are subjected, (*b*) the access of atmospheric air, (*c*) the temperature, and (*d*) exposure to sunlight and daylight; that the waste water from houses and industrial establishments should be irrigated; that gravel and sand filters are best adapted to filter river-water on a large scale.

The Disinfecting Power of Soap-solution.—Jolles[1] made a sterilized solution from soap with 67.44% of fatty acids, 10.40% of total alkali, and 6.041% of free alkali, and this was incorporated with meat-juice-peptone bouillon containing the germs of typhoid fever and bacillus coli communis. Ten sets of test-solutions were observed at different times and temperatures. The experimenter found the soap solution had better disinfecting properties at low temperatures (4° C. to 8° C.) than at ordinary temperatures. Between 18° C. and 30° C. there is little difference in the antiseptic power of the solution. Rags treated with a 1% soap solution showed injury to the contained germs in 15 minutes, while with a 6% soap solution all germs on the rags were destroyed. Soap therefore furnishes a powerful and safe disinfecting agent for certain disease-germs.

Contents of the Healthy Stomach.—Gillespie[2] says: Free hydrochloric acid does not appear in the stomach till from ½ to 3 hours after a meal. During digestion it is combined with proteid, and is less antiseptic than free acid. After a meal there is from 0.09 to 0.27% of free hydrochloric acid in the stomach, according to the food taken. During digestion albumin increases, albumoses remain stationary, while peptone and the inorganic salts, especially chlorids, diminish.

The Hydrochloric Acid of the Stomach.—Hydrochloric acid is the only normal acid in the stomach, and is derived from the chlorids of the blood. It is not the free acid that is the active digestive agent, but the albumin compounds of it. The free acid appears only after digestion is finished. The formation of acid albuminate is necessary to the action of pepsin on albumin; the peptonizing of albumin is quite a secondary function of the stomach.[3]

Cholera-bacilli and Uncooked Milk.—Contrary to the conclusion of Hesse, who claimed that uncooked milk had the property of killing the cholera-germ in 12 hours, Basenau[4] says that up to the point of coagulation these bacilli in milk increase in number, and continue active even after the milk is soured, and that milk is by no means a prophylactic against cholera.

Modified Milk and Sterile Milk.—Leeds[5] says cow casein and human casein differ in chemic composition, in their relations to the mineral substances in the two fluids, and in their behavior with chemic reagents. With acetic acid cow's milk yields a dense casein precipitate, while woman's milk pre-

[1] Zeit. f. Hyg., 1895, p. 130, quoted in Boston M. and S. Jour., Feb. 27, 1896.

[2] Rep. of Lab. R. C. P., Edin., 1894; Jour. Chem. Soc., 1895.

[3] Am. Med.-Surg. Bull., Sept. 15, 1895.

[4] Arch. d. Hyg., xxiii. p. 170, quoted in Am. Jour. Med. Sci., Jan., 1896.

[5] Am. Jour. Med. Sci., Sept., 1895.

cipitates but a small fraction of its casein. This fact is apparent even when there has been an aqueous dilution until the percentage of casein is the same in both milks. The inability to precipitate the casein of woman's milk by acetic acid makes it difficult to determine how much fat is separated when casein is precipitated. Casein and fat do not stand in any fixed ratio in milk. The assumed ratio in cow's milk is 1 to 1.16. Leeds found it to be 1 to 1.22, and in woman's milk 1 to 3. Therefore the coagulum of cow's milk would contain only about $\frac{1}{3}$ the amount of fat found in the coagulum of woman's milk. The general practice is therefore to add fat to cow's milk intended for infant-feeding till the ratio stands 1.22 of casein to 3 of fat. Yet experiment shows that in the laboratory the presence of the excess of fat added to cow's milk makes no change in the inherent nature of the particles composing the clots themselves. The surplus fat serves as an attenuant, and the same effect is produced on the coagulum by adding gum, sugar, dextrin, extract of barley or oatmeal, etc. The latter bodies are, however, foreign and abnormal to natural infant food, while butter-fat with lactalbumin and lactose are natural attenuants of the clot. A deficiency in lactalbumin is not satisfactorily removed by adding strained egg-albumin. Lactose is useful in attenuating the clot of cow's milk. Leeds recommends also globules of butter-fat and soluble proteids (noncoagulable by acids). The lactose and fat of cow's and woman's milk are practically identical in composition. The "humanized" milk made by diluting cow's milk $\frac{1}{2}$, and adding $\frac{1}{8}$ of the total of average cream contains, according to Leeds, 1.74 of casein and 0.44 of albumin, while human milk contains 1.35 of casein and 0.65 of albumin. Albumin has been added to overcome the deficit, but the excess of casein persists. This insoluble proteid may be diminished by "an incipient and very partial peptonization of the casein," which process has the advantage of being at the same time a sterilization. To sterilize milk it is not necessary to heat it above 100° C. Spores requiring so high a temperature to destroy them are rarely present. Leeds found that 70° C. continued for a $\frac{1}{2}$ hour usually destroyed all bacteria in milk. Infants fed upon sterilized milk lose much more nitrogen in the feces than those fed on raw milk. It is possible that the unfavorable results noted by careful observers in feeding infants on sterilized milk, as compared with breast milk, are due to the relation of the casein of cow's milk as compared with that of woman's milk, as already noted.

Microorganisms in Milk.—Freeman[1] says the milk of a healthy cow as it comes from the udder is practically sterile, yet the milk delivered to the consumer in large cities is contaminated with many microorganisms. As many as 15,000,000 bacteria have been found in a single drop of city milk. Most of these are nonpathogenic, and may be classed as "dirt." Milk drawn and handled by clean, rapid methods contains only $\frac{1}{1000}$ as many bacteria. These germs cause the milk to sour, and some of them cause diarrhea in children. The loose dairy-methods which favor the entrance of so many microorganisms multiply the chances of introducing pathogenic bacteria. Disease-

[1] Am. Med.-Surg. Bull., Jan. 25, 1896.

germs may enter in milk from the udder or tissues of the cow. Milk is a good culture-medium. If contaminated by specific disease-germs, it may readily give rise to an epidemic. The bacillus tuberculosis is readily inoculated through milk; 7% of all cattle in New York State are tubercular, if the tuberculin-test is reliable. Ernst, Bang, and others have shown that general tuberculosis in cows, without any disease of the udder, may engender tubercle-bacilli in the milk of those cows. The mixing of milk from different cows increases the chance of tubercular infection. Tuberculosis in cows is very common, but hard to detect by ordinary physical examination. Freeman recommends the tuberculin test as delicate and harmless to sound cows. He considers it our best protection against the tubercular contamination of milk, but he urges also better dairy inspection and control, with a view to diminishing the chance of infecting milk with pathogenic microorganisms of any kind.

Effects of Definitely-related Chemic Compounds on Animals.[1]—If hydroxyl be substituted for hydrogen in phenol, the physiological action of the drug is intensified, subject, however, to a certain influence due to position isomerism. The reducing phenols are the most active therapeutic agents. Alkyl radicles substituted for hydrogen modify the physiologic action, while nitrogroups both change and intensify it. The presence of one nitrogroup affects the circulation mainly, the nervous system hardly at all, the action increasing as we pass from the orthocompounds to the paracompounds. The results are intensified as more nitrogroups are substituted. The nitrobenzenes show a similar but less powerful action. Nitranilins stimulate the vagi peripherally and alter the hemoglobin of blood. Anilin itself affects the nervous system mainly, but the nitranilins affect it very little. Methyl groups substituted in anilin (toluidins) resemble therapeutically the nitranilins.

Some Chemic Properties of Certain Alkaloids.[2]—The effect of decomposing animal matter on strychnin is to render it in time irresponsive to the color and certain other chemic tests, though its bitter taste and therapeutic action are still preserved. Ordinary toxic doses of morphin and strychnin indicate that the absorbed portions of the alkaloids found in the tissues lose the property of crystallizing, but in cases where very large amounts of these drugs are taken they may be recovered in the crystalline state, as considerable portions of the dose diffuse by simple exosmosis.

The Hygiene of the Kidney.—Simes[3] says unhealthy kidneys may beget an unhealthy heart, lungs, brain, or nervous system. In watching the kidneys make allowance for diet, liquids taken, exercise, and perspiration. No reliable conclusion can be based on an examination of anything but the total urine voided in 24 hours. Most people eat too much, and drink too little water. The milk diet owes some of its benefits to the normal presence of the water in this fluid. Food should be masticated, however, and not

[1] Jour. of Chem. Soc., 1894, ii. 393, from Am. Chem. Jour., xvi. 443, quoted in Boston M. and S. Jour., Sept. 5, 1895.

[2] Am. Jour. Pharm., pp. 13, 561, quoted in Boston M. and S. Jour., Sept. 5, 1895.

[3] Med. Rec., Oct. 12, 1895.

simply *washed down* without a proper mixture of saliva. The good results of a sojourn at a mineral spring are often due to flushing of the system with water. An excess of water, on the other hand, overworks the kidneys. Warm clothing prevents renal congestion. Judicious bathing is useful.

Uric-acid Gravel.—Harley[1] says the theory that uric acid is a proteid waste-product incompletely oxidized, and on the way to become urea, would suggest that uric acid in excess should occur in the urine of all persons suffering from diseases where imperfect oxidation exists; but this is not the case. Birds, moreover, excrete uric acid normally, and uric acid given by the mouth does not appear in human urine as an excess unless the blood be kept alkaline. Nuclein, and not the general proteids, has been suggested as the antecedent of uric acid. Horbaczewski made some successful experiments in support of this theory. Nuclein by the mouth increases uric-acid elimination (Horbaczewski) or (according to Stadthagen) urea. These contradictory opinions have yet to be investigated. Marès found a double quantity of uric acid in urine excreted after meals, as compared with the urine of fasting periods, animal foods being most favorable to the rise in uric acid. This has been attributed to the increase of leukocytes after nitrogenous feeding and the consequent increase of nuclein. Leukocythemia is associated with a large increase of uric-acid elimination, attributed to the excess of nuclein derived from the increased number of leukocytes. Other diseases, such as pneumonia, show a similar phenomenon. The leukocytosis following the administration of pilocarpin and phosphorus are associated with an increase of uric acid in the urine. Alcohol also increases uric-acid excretion.

Causes of Uric-acid Deposits.—Ritter[2] says that why uric-acid deposits in urine occur not only in pathologic cases, but in many healthy individuals, and in instances in which the degree of urinary concentration does not seem to warrant their insolubility, is a fact not yet adequately explained. The brickdust deposit, according to Bence-Jones, is a mixture of which a portion is the excess of uric acid unsatisfied by the alkalies present. Zemer believed that the precipitation of the urates depends solely on the relation of the disodic phosphates to the urates. Ritter, by experiment, found—1. That when only monosodic phosphate and the acid urate salts are present, the crystalline urates are deposited, unless the degree of concentration is so great that the salts do not act on one another at all; 2. That those urates formed by the union of monosodic phosphate and acid sodium urate are held in solution by disodium phosphate; 3. When disodium phosphate is present with acid sodium urate in concentrated solutions the typical crystals of acid-sodium urate are formed either in alkaline or neutral solutions. Ritter thinks the tophi of gout are formed in the same way. The appearance of sediments of urates denotes an action on the part of the phosphates, and the crystalline urates or brickdust deposit depends either on a total absence or a relatively insufficient quantity of disodic phosphate.

[1] Brit. Med. Jour., No. 1786, 1895, p. 637, quoted in Am. Med.-Surg. Bull., Oct. 15, 1895.

[2] Münch. med. Woch., 1895, p. 414; Am. Med.-Surg. Bull., Sept. 15, 1895.

Rare Urinary Calculi.—Horbaczewski[1] reports 2 rare forms of calculus, 1 containing free fatty acids, fats, and soluble soaps of calcium and magnesium, besides other unusual constituents, and the other containing 95% of organic matter, almost all of which was cholesterol.

The Measure of Acidity or Alkalinity in Organic or Other Fluids.—Nichols[2] proposes a uniform system to express the results of volumetric acidimetry and alkalimetry. The natural standard being the normal solution (alkaline or acid), it is fixed at the number 1. All other degrees of acidity and alkalinity are indicated by numbers relative to this unit, which is expressed as *N*. When the acidity of the fluid is $\frac{22}{1000}$ of a normal acid solution, it is expressed as .022 *N*. A fluid of which 10 c.c. is neutralized by 4.5 c.c. of decinormal acid has an alkalinity of .045 *N*. A double normal solution would be 2 *N*; a decinormal, .1 *N* or $\frac{N}{10}$. Nichols uses plus (+) as a sign for acids and minus (—) for alkalies. The normal factors as given facilitate computation of percentages by weight of substances present.

Notes on Urine Analysis.—The addition of solids to urine to clarify it is not recommended by Smith.[3] In the nitric-acid test for albumin a mere cloudiness above the contact-zone does not signify albumin. The mucus always present in urine yields *nucleoalbumin*, which cannot be perfectly precipitated by acetic acid, and is a source of error in inferences. With the ferrocyanid test nucleoalbumin (from mucus) gives a mere opacity, while true albumin gives a finely flocculent precipitate. Alimentation is a factor in the results of all quantitative estimations. Slight variations in the amount of uric acid excreted are within the limits of a healthy condition. The ratio of urea to uric acid in an experimental case (normal) was 1 : 54; in a neurasthenic case, 1 : 37.6. The use of alcohol increases uric-acid excretion.

The Elimination of Arsenic and its Detection in the Urine.—Mann[4] says arsenic in as small amounts as 1 part to 200,000 of water can be detected in the urine by Reinsch's test any time short of 11 days after its absorption. To apply the test accurately evaporate 12 to 16 oz. of urine to $\frac{1}{4}$ its volume, and boil for 15 minutes with the reagents before accepting a negative result. Prove the HCl and copper-foil used to be free of arsenic, and carry the test to the sublimation of the arsenic and its crystallization as As_2O_3.

Oxaluria and the Excretion of Oxalic Acid in Urine.—Dunlop[5] says alcohol added to the urine precipitates crystals of calcium oxalate (Reach's method). The centrifuge facilitates the deposit of the crystals. Oxalic acid is regarded by Dunlop as a normal and constant constituent of human urine. The salts of this acid precipitate in some urines, due mainly to the presence of an excess of oxalic acid. Food-stuffs containing oxalic acid are the source of the acid in the urine. "Oxaluria has no pathologic entity;" its occurrence has no diagnostic value.

[1] Jour. Chem. Soc., 1894, ii. 24, from Zeit. phys. Chem., xviii. 335, quoted in Boston M. and S. Jour., Sept. 5, 1895. [2] Med. Rec., Oct. 3, 1895. [3] Ibid., Jan. 4, 1896.

[4] Med. Chron., 1895, ii. p. 413, quoted in Am. Med. and Surg. Bull., Aug. 15, 1895.

[5] Edin. Med. Jour., Jan., 1896.

Urinary Pigments.—According to Garod,[1] urospectrin, a pigment similar to hematoporphyrin, found in normal urine, is extracted by shaking the urine with acetic ether. The residue from this solution after evaporation is soluble in ether, especially in the dark. The ether extract contains the new pigment, urospectrin, associated with the chromogen of urobilin. The latter decomposes in the light, and the urobilin is removed by shaking with water. Garod says that hematoporphyrin is a scanty but constant ingredient of normal urine. He extracts it by adding to 100 c.cm. of urine 20 c.cm. of a 10% solution of sodium hydroxid. This precipitates the phosphates, which are washed with water and redissolved in rectified spirit. After acidulation with hydrochloric acid the solution shows bands of acid hematoporphyrin. The alkaline pigment may be obtained by adding ammonia to precipitate the phosphates, acetic acid to redissolve them, and extracting the pigment with chloroform. Studensky removes urobilin from the urine by taking 20 c.cm. of urine and treating it with 1 : 10 solution of saturated copper sulphate solution, then saturating with crystallized ammonium sulphate, and adding 10 c.cm. of chloroform. The mixture is shaken some minutes, and the copper-red layer of the chloroform solution is removed by a separating funnel. It is then compared with a standard urobilin solution in chloroform. The standard solutions are kept as long as 2 months by covering the surface with a layer of saturated ammonium sulphate, closing the vessel and placing it in the dark.

Bile-pigment in Urine.—After a comparison of 20 tests, Jolles[2] recommends Rosenbach's modification of Gmelin's test as being as delicate as the original, requiring only 5% of bile to produce a reaction. Rosin's and Huppert's tests each react with 20% of bile.

Chloroform in the Urine or Other Liquids.[3]—The test consists in passing a current of pure hydrogen through the suspected liquid, and burning the gas at its exit. A fine brass gauze thrust into the flame assumes a bluish-white color. The products of this combustion are removed from the wire gauze and placed in a solution of ammonium hydroxid (ammonia). A blue color appears, and the presence of free chlorin is detected. Urine containing chloroform reduces the solutions of Fehling and Trömmer. Vitali's results concur with those of Kast, von Mering, and Zeller, but are opposed to those of Bréaudet.

A Delicate Test for Albumin.—Adolf Jolles,[4] on the grounds of the delicacy and effectiveness of the reagent, independent of the composition of the urine, recommends the following solution: Mercuric chlorid, 10; succinic acid, 20; sodium chlorid, 10; water, 500. This reagent is more sensitive than potassium ferrocyanid; it will detect albumin in the proportion of 1 : 120,000.

[1] Bull. de Thérap., quoted in Boston M. and S. Jour., Sept. 5, 1895.

[2] Jour. Chem. Soc., London, 1894, ii. p. 171, from Zeit. phys. Chem., xviii. 445, quoted in Boston M. and S. Jour., Sept. 5, 1895.

[3] Jour. Chem. Soc., London, 1894, ii. 149, from L'Orosi, quoted in Boston M. and S. Jour., Sept. 5, 1896.

[4] Hoppe-Seyler's Zeit. f. phys. Chem., 1895, xxi. No. 4, p. 306: Am. Med.-Surg. Bull., June 6, 1896.

Errors in Spiegler's Test for Albumin.—Sharp[1] substitutes glycerol for sugar in Spiegler's test, which was, originally, mercuric chlorid 8 parts, tartaric acid 4, sugar 20, and distilled water 200. The sugar and glycerol are added for the purpose of raising the density of the mixture and allowing the urine to float. In the absence of, or in case of a deficiency of, chlorids, the test does not act with weak albumin solutions, or acts very slowly. This is to be remembered in testing urine secreted during diseases which diminish the amount of chlorid in urine. On the other hand, an excess of chlorids or of tartaric acid hinders the precipitation of albumin by mercuric chlorid. Sharp inclines to favor the old nitric-acid test for albumin as less open to possible error and objections than Spiegler's or other tests, such as picric or trichloracetic acid.

Albuminuria.—Although globulin is associated with albumin in the urine, the amount is so variable that it is of no use in determining the variety of kidney in any given case. In the investigation of Boyd[2] the total proteids were estimated by boiling the urine, estimating the proteids, and removing the globulin by half-saturation with ammonium sulphate. The globulin was estimated by the difference.

Peptonuria.—The proteids present in cases of so-called peptonuria are albumoses, not true peptones. The presence of these bodies is an almost invariable symptom of croupous pneumonia and purulent meningitis, sometimes of articular rheumatism, and occasionally of leukemia. Robitschek says peptonuria occurs often in phosphorus-poisoning and during suppuration. L. Sior[3] notes the absence of these bodies in the urine of children.

Nucleoalbumin in the Urine.—Nucleoalbumin[4] may occur in the urine in rare cases where there is extensive disintegration of renal epithelium, but it is usually absent from the secretion.

The Value of the Usual Tests for Sugar in the Urine.—Jolles[5] says a high specific gravity is not a constant indication of sugar; that sugar is not a normal element in the urine; and that small amounts of sugar do not affect its density much. The results obtained from Trömmer's and Worm-Müller's tests are often confusing, and as much as 0.24% may escape them. Urines containing less than 0.3% do not react well with Nylander's test. Out of 200 specimens examined with the polarimeter and the Fehling-Wendriner quantitative method, 66 gave accurate results. Jolles recommends the phenylhydrazin test for doubtful cases. He boils the test-tube containing the urine and reagents in the water-bath for an hour, and then lets it stand for from 12 to 14 hours. Hoppe-Seyler's test with alpha-nitrophenylpropionic acid is rated in delicacy at about 0.4%.

[1] Lancet, 1894, p. 536, quoted in Am. Med.-Surg. Bull., July 15, 1895.

[2] Jour. Chem. Soc., London, Mar., 1895, ii. 82, from Rep. of Lab. R. C. P., Edin., 1894, quoted in Boston M. and S. Jour., Sept. 5, 1895.

[3] Centralbl. f. die med. Wissensch., 1895, p. 467; Chem. Centralbl., 1894, p. 780; Jahrb. f. Kinderh., xxxvii. p. 352; quoted in Boston M. and S. Jour., Sept. 5, 1895.

[4] Centralbl. f. die med. Wissensch., 1895, p. 413, quoted in Boston M. and S. Jour., Sept. 5, 1895.

[5] Aerzt. Rundsch., No. 3, 1895, p. 40.

The Value of the Phenylhydrazin Test for Sugar.—The urine of 50 persons with no glycosuria was tested by Williamson[1] by boiling with phenylhydrazin hydrochlorid and sodium acetate, and examining in the cold some time later, with a uniformly negative result. In cases in which sugar was present bright sulphur-yellow crystals of phenylglucosazone were found in 6 or 8 hours or less. Crystals of glycuronic acid, similar to the phenylglucosazone, occur in rare cases, but generally on account of some drug taken, in which case discontinuance of the medicine causes the glycuronic acid to disappear. Williamson thinks the chance of error in this test very slight. He commends it for sensitiveness before Fehling's and the fermentation test, and as giving a reaction in dilute urine with .015% of sugar. Phenyl-hydrazin is too delicate in its reactions for use when prolonged boiling and the water-bath are used. It is an excellent negative test, and may be used to confirm a result which appears slightly dubious with Fehling's. Glycuronic acid and pentose are the only substances in the urine which may be confused with the various sugars by the phenylhydrazin test, while there are many sources of reduction besides sugar with Fehling's solution.

The Verification of Sugar-testing in the Urine.—To remove normal ingredients of the urine which tend to mislead the observer in delicate sugar-tests (such substances as uric acid, kreatinin, etc.), Dr. Roberts[2] recommends filtering through animal charcoal the urine to be examined. The filtrate, having no color, shows Fehling's reaction readily, and the urine is less dense. For delicate tests Fehling's process is recommended in preference to the fermentation process.

A Delicate Method of Estimating Sugar in Urine.—The uric acids, xanthin, hypoxanthin, phosphates, etc., are precipitated by boiling 8 c.c. of the urine with 5 c.c. of the copper sulphate solution, as used in Fehling's test. On cooling add 1 to 2 c.c. of a saturated sodium acetate solution. Filter and add 5 c.c. of alkaline tartrate solution of the usual strength, and boil the mixture 15 to 20 seconds. The orange-yellow cuprous oxid precipitate separates in the presence of more than 0.25% of sugar, and in the presence of less amounts on cooling. Allen[3] prefers phenylhydrazin in qualitative sugar estimations of sugar.

A New Method of Estimating Sugar in the Urine.—Elliott[4] objects to Fehling's test for saccharine urine on the ground that, as it depends wholly upon the reducing power of sugar as indicated by a copper-test solution, it lacks delicacy, and, because of the normal presence of other reducing agents in the urine, it is not an accurate method in the hands of any but very experienced workers. He claims that copper reduction will take place in Fehling's solution with normal urine which is concentrated and of high density. The following test is proposed to detect as little as one-tenth of 1% of sugar. Two solutions are prepared: No. 1 contains—Copper sulphate

[1] Med. Chron., 1895, iii. No. 5, pp. 333–341, quoted in Am. Med.-Surg. Bull., Nov. 15, 1895.
[2] The Practitioner, Jan., 1896.
[3] The Analyst, xix. 178.
[4] N. Y. Med. Jour., July 27, 1895.

(C. P.), gr. xxvij ; glycerol, pure, f℥ij ; distilled water, f℥iss ; sodium hydroxid, ad f℥iv. No. 2 is a saturated solution of tartaric acid (C. P.) in distilled water. These solutions will keep indefinitely and are used as follows : Heat to boiling 1 dr. of No. 1 in a test-tube ; then add 2 or 3 drops of No. 2 and boil again. The urine is then added slowly, drop by drop, shaking the test-tube after each drop until reduction occurs. The presence of sugar is indicated by a yellowish or reddish (sometimes greenish-gray) precipitate of copper suboxid, which accumulates on standing. If this reaction fails to occur after 8 drops of urine have been added, there is no appreciable sugar present ; 1 drop will be followed by a reaction where sugar is present in large amount. For quantitative estimation proceed as follows : Place 133♏ of Solution No. 1 in a flask and add 6 drops of Solution No. 2, with 3 dr. of liquor ammoniæ (U. S. P.). Mix thoroughly, and add distilled water to make 2 ounces. The cuprous oxid formed is dissolved in the ammonia, giving a clear blue which completely disappears in the end-reaction. The foregoing amounts of the test-solutions represent in sugar value ¼ gr. The application of the test is the same as in Pavy's or Purdy's method.

The Picric-acid Test for Sugar.—McDonald[1] says the picric-acid test for sugar in the urine depends upon the reduction of potassium picrate, formed in the reagent solution, to picramate by the deoxidizing power of dextrose, and the appearance of the orange-red color characteristic of the picramate. He notes the complicating disturbance of the test by the presence in normal urine of kreatinin, and also the modification of the reaction which is caused by dilution.

The Estimation of Urea by Hypochlorite or Hypobromite.—Thudichum[2] regards the hypochlorite process of estimating urea as unreliable, and the hypobromite substitution as open to a like objection. The latter substance is so unstable that it has to be freshly prepared from liquid bromin and caustic soda. If the process worked perfectly, 0.1 gram of urea should yield 37.14 c.c. of N at standard conditions. Practically, this never occurs. The result varies with the concentration of the hypobromite and of the urea solutions, with the concentration of the mixture of both solutions, with the time allowed for the reaction, with the contents of the eudiometer (mercury being the best), with the apparatus used, and with the personal care of the observer. Falck showed the N evolved comes from other nitrogenous matter in the urine besides the urea, so that if only a urea determination is desired, the hypobromite process gives an excess of N, while, as it does not liberate all of N from the substances which contain it, the process will not serve to determine the total N present. Liebig's method is superior in this regard. Urea may be separated in solution from urine by treating the secretion with mercurammonium and filtering through charcoal to remove alkaloids. The filtrate is pure urea solution. Thudichum recommends Liebig's process as indicating the amounts of N present in the three principal forms, and as being generally better for clinical purposes.

[1] Lancet, Feb. 22, 1896.

[2] Med. Press, Dec. 25, 1895, p. 657.

Some Dubious Reactions for Alleged Carbohydrates in Urine.—According to Thudichum,[1] the reduction of copper acetate by dextrose requires from 12 to 60 hours for its completion. In the cold the solution of this salt is a test for dextrose, but the mixture should not be heated unless acetic acid be added also to prevent the oxidation of dextrin, which would then also reduce the copper. Copper acetate with acetic acid is Barfoed's test for dextrose. Its application is slow, and involves the danger of reoxidation of the copper by the air or decomposition of the acetate by heat. This test will, however, detect, under proper precautions, $\frac{1}{32}\%$ of dextrose in solution. Worm-Müller diluted the solution used by Barfoed, till it valued 4% of the salt and 1% of acetic acid. This observer claims that "*normal urine contains a substance or several substances which reduce copper in an acid acetate solution*," and that this substance cannot be dextrose—a conclusion which seriously impeaches the test. Müller and Hagen prefer Knapp's to Fehling's solution in testing animal fluids; Thudichum does not. Thudichum made experiments which show that this reduction in urine with Barfoed's test, not due to dextrose, is due to at least one of the alkaloids—namely, urotheobromin—or to urotheobromin and kreatinin. If the alkaloids be removed by animal charcoal and the solution be made alkaline by mercuramin, a reduction of alkaline copper tartrate (Fehling's) means the presence of dextrose.

Carbohydrates in Normal Urine.[2]—The total amount of carbohydrates (reckoned as glucose) in normal urine is 0.01%. Of glucose, the amount actually present is 0.005%, the carbohydrate residue being a dextrin-like substance (animal gum) and a third ingredient, probably isomaltose.

The Reaction of Sulfonal in Urine.—According to Lafon,[3] urine containing sulfonal tested with Fehling's gave the yellow copper suboxid precipitate in 20 cases, and slight left-handed deviation by the polariscope.

The Alkaloids of the Urine.—Thudichum[4] says that experiment shows that of the nitrogen discharged daily in the urine of a male adult, 1.8436 g. is in the shape of alkaloids, of which there are six; urotheobromin ($C_7H_8N_4O_2$) is one of these. Its compound with copper oxid, boiled with pure water, reduces the oxid steadily. A pure cupric compound is hard to obtain. The solution of all the alkaloids reduces copper acetate in acid liquid to cuprous oxid, and has a similar action on other oxidized substances.

The Clinical Import of Hypoxanthin.—According to Thudichum,[5] hypoxanthin is an alkaloid of the uric-acid group. It is usually not excreted by the urine; its presence in that secretion is always associated with albuminuria and some form of aberration of the kidneys. Copper acetate added to the urine precipitates urotheobromin and urochrome. Hypoxanthin is separated from these two compounds by dissolving the precipitate in an excess

[1] Med. Press, Sept. 11, 1895.

[2] Zeit. phys. Chem., xviii. p. 193; xix. p. 339; xx. p. 249, quoted in Boston M. and S. Jour., Sept. 5, 1895.

[3] La Sem. méd., May, 1895, quoted in Univ. Med. Mag., Feb., 1896.

[4] Med. Press, Apr. 3, 1895.

[5] Ibid., Oct. 9, 1895, p. 361.

of cold nitric acid and adding silver nitrate to the solution. The latter salt forms a compound with hypoxanthin, the new compounds being insoluble in nitric acid, while the urotheobromin products are soluble. Hypoxanthin dissolves in hot nitric acid, but crystallizes from it on cooling. The phosphomolybdic process followed by the foregoing reaction serves to isolate hypoxanthin from large volumes of renal secretion.

The Cobalt-carbonate Test for Free Acid in Gastric Juice.—The cobalt carbonate for this test was freshly prepared by Kuratkowski.[1] The reaction shows a change from rose-color to blue, due to the production of cobalt chlorid by the action of the free hydrochloric acid in gastric juice. Neither lactic acid, butyric, nor acetic peptones, nor acid sodium phosphate, yields this reaction. It is hindered by the presence of mercury or sodium chlorids, ferric chlorid, or ammonium chlorid. This reaction appears if 1 part in 10,000,000 of free hydrochloric acid be present. It is 500 times more delicate than the phloroglucol-vanillin test.

Ehrlich's "Diazo-reaction."—This reaction, Ettles[2] says, occurs occasionally in the urine of healthy persons; invariably in typhoid fever and pneumonia; generally in pleurisy; frequently in measles, peritonitis, suppurative inflammation, erysipelas, phthisis. Occasionally it is present in rachitis and diabetes mellitus, but seems to be absent in malignant and chronic non-tuberculous lesions. Rötheln may be distinguished from measles by its absence. Suspicions of typhoid are confirmed by its presence, and tuberculous phthisis is differentiated from chronic pulmonary diseases.

[1] Gaz. des Hôp., quoted in the Canad. Pract., Dec., 1895.

[2] Med. Times and Hosp. Gaz., July 20, 1895, quoted in Internat. Med. Mag., Oct., 1895.

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